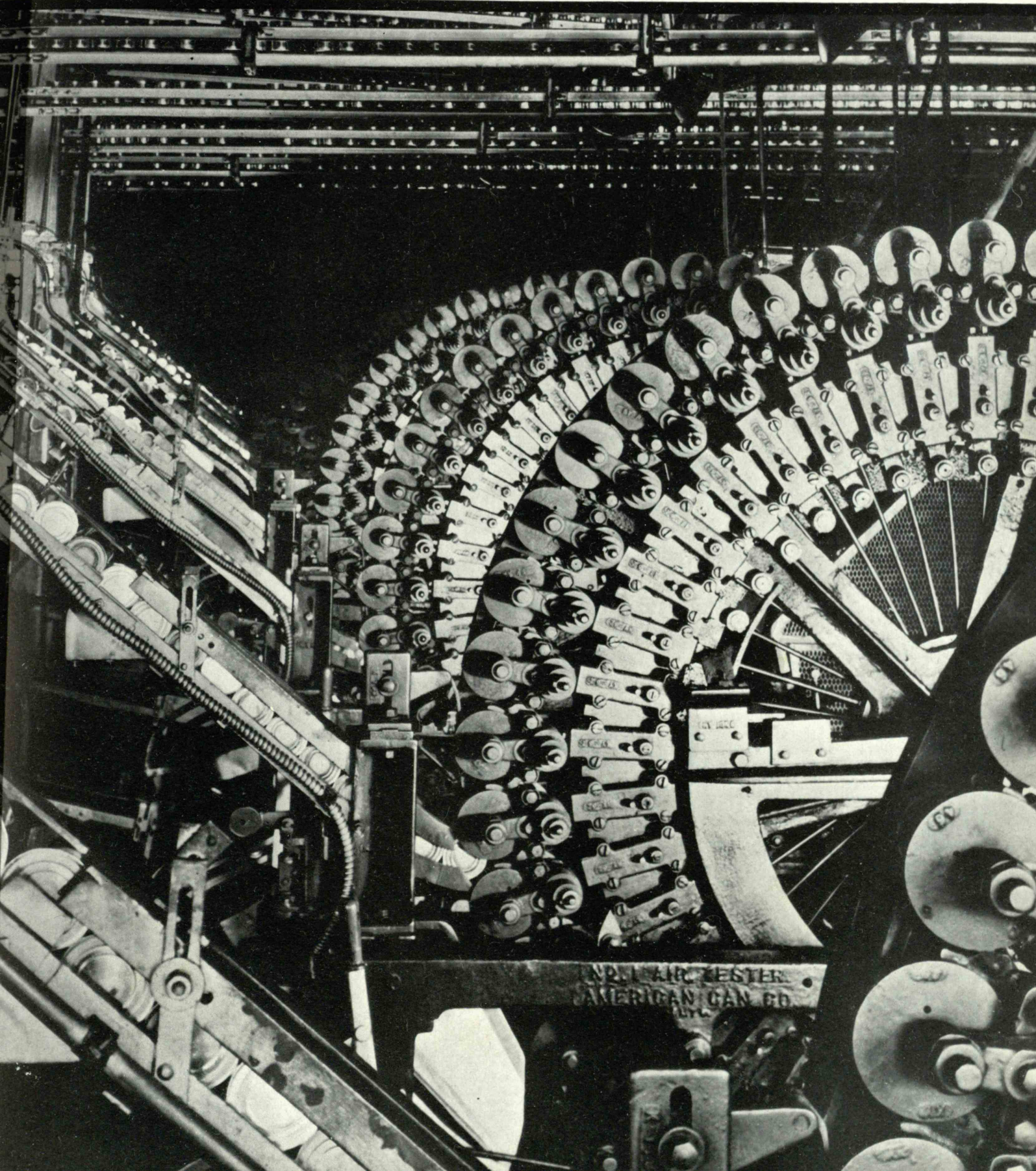


December 1937

TECHNOLOGY REVIEW

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technology review

Published by MIT

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THE TABULAR VIEW

SOME of the best received articles which The Review has published have been suggested by our readers. This quite naturally leads us to invite suggestions for future subjects which subscribers would like The Review staff to illuminate. Some suggestions are already in hand, and to stimulate further ideas, we list these:

1. An executive of a great oil company asks us to present a popular explanation and interpretation of the polar-front theory of air-mass analysis, which has received such great impetus in this country from the work of Technology's meteorological staff. This theory has been adopted by the United States Weather Bureau and is helping notably, not only in the form of better weather broadcasts but by aiding our understanding of weather phenomena.

2. "Personally," writes the associate editor of a well-known technical magazine, "I should like to see a Review article dealing with recent advances in, and a critical comparison of, the various commercial systems of making amateur color photographs, both transparencies and 'opaques,' and including a critical evaluation of Kodachrome, Dufaycolor, Agfa color plates, Finlay plates, and any others — if any. The story should be written by some well-versed, disinterested party. . . ."

3. From this same reader comes a second suggestion that we have an article from the news or human-interest angle on the transmission of news pictures by wire. This is one of the most spectacular communication developments of recent years, particularly the transmission of pictures over ordinary telephone instruments.

An example of an article suggested by a reader is the article on appertizing, or canning, in this issue. We hope that these examples will inspire additions to this list. As we have announced before, we also always welcome suggestions for striking pictures from our readers, as well as actual pictures themselves.

IT may not be immediately obvious, though it is demonstrably true, that an expert on housing should be able to write authoritatively on the canning industry (page 71). Possibly JOHN E. BURCHARD'S ['23] pre-occupation with that human can, the trailer (The Review, May) or the prefabricated house, was but a step toward studying the habitat of the sardine. ¶ The engineers and scientists who replied to The Review's questionnaire on the automobile really wrote the article on page 75. Please note that readers are urged to send in their own conceptions of tomorrow's car. ¶ The physicist who plays with cosmic rays must of necessity also flirt with the stars. PHILIP M. MORSE, Associate Professor of Physics, is no exception; he seems well acquainted (page 77). ¶ At its sesquicentennial in October, Franklin and Marshall College bestowed upon KARL T. COMPTON, our President, an honorary degree of LL.D. The Review presents (page 81) the address on Benjamin Franklin which Dr. Compton delivered at that time.

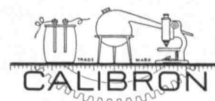
No. 2

Just for Fun!

A CHALLENGE

TO YOUR INGENUITY

WITH two 4's and the ordinary symbols of Arithmetic and Algebra it is possible to express each of the three numbers 32, 36, and 64 — but can you do it?



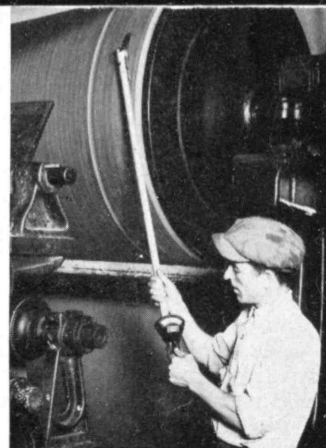
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MAIL RETURNS

PICTURES AND LETTERS FROM REVIEW READERS

Let's Argue It

FROM ALBERT MAYER, '19:

I have just received the alumni appeal for funds and the accompanying pamphlet. At first, I thought the printer had mixed things up, because the printed appeal was for a recreational building, but the photographs showed what appeared to be a Classical mausoleum, a Greek temple, or a museum of ancient art.

Unfortunately, I found, after further study, that the archaeological affair and the recreational center were the same thing. Surely this is a ghastly misstep. This reproduction of a dead architecture has nothing to do with the spirit of Technology, whose essence is the realistic search for scientific and engineering and human progress; nor has its cloaking, static façade anything to do with the freedom of spirit and movement which should be inherent in a center of recreation. To be consistent with the gymnasium architecture, the Institute's Departments of Physics and Chemistry should be teaching that there are four elements — earth, air, fire, and water; in its Electrical Department, which might be further advanced, the Leyden jar would be the last word in apparatus; and in the Structures Course, only the theory of masonry structures and stone arches should be taught. Or possibly a more accurate comparison would be if the Institute kept to its present advanced program but published the results in Latin or Greek.

The answer is, of course, that we have progressed far beyond those primitive concepts and methods. And so we have in building construction and architecture. The dead hand of anachronism and fake is just as fatal in architecture, in its phony effect on the beholder, as is more palpably the case in the study of engineering and science.

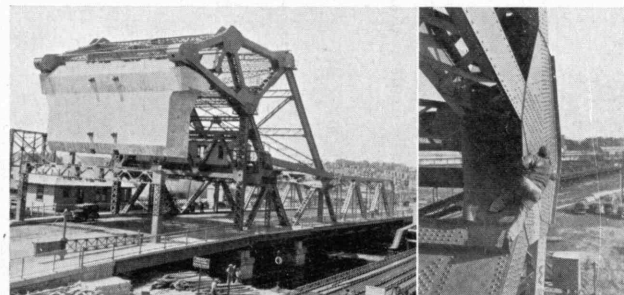
Why is such a thing possible at Technology? The argument may be advanced that the main building is Classic; therefore this should be. . . . Of course, I am aware that our American institutions of learning have a passion for uniformity of style, whether Gothic, Colonial, or Classic. But surely this is the negation of what should be the provocative, forward-moving spirit of education and research. Technology, above any other institution, should avoid this snobbish, static attitude. Why should not the architecture reflect the forward march, the inevitable changes of viewpoint of a dynamic society? Why should not this building reflect the fact that it is built of structural steel or reinforced concrete? Why should its forms and fenestration be placed into the strait jacket of a stone-masonry structural system current two thousand years ago? Why shouldn't this recreational building look like a recreational building? Why should it be indistinguishable from a museum, a Federal Reserve bank, a post office? It will be distinctly an architectural loss when the new Classic jewel replaces the present refreshing, straightforward, wooden building.

If the Classic treatment is retained, I suggest that in accordance with custom, there be a frieze of incised names of men famous in the field, such as Babe Ruth, Red Grange, Zbyszko; or if they are modern anachronisms, we might have research conducted to ascertain the names of prominent gladiators and chariot drivers.

The architecture of this building is a very fundamental question indeed. It seems to me that without stopping the progress of the campaign, it would be the best plan to have the Alumni and the students express their views. The cam-

paign will take some time. Plans and façade can be restudied in ample time. Let's argue it, and then let's vote on it.
New York, N. Y.

FROM ARTHUR W. VOSE, '13:



The picture of the Chelsea Street Bridge in the June number of *The Review* was of special interest to me because I was connected with its construction. I am sending you prints . . . which I took while on the job. The completed bridge is simple in appearance when compared with its complex skeleton. Huge rockers and a thousand-ton counterweight overhanging the roadway are the striking features of this type of bridge. Strength, and efficient service for motor traffic and ocean tankers, it provides at low cost. In the midst of oil-storage tanks, along Chelsea Creek, beauty of line would have been misplaced. The bascule is called the modern version of the old castle drawbridge. In each, the similarity of operation is apparent, and in each is found romance of the builder's art.
Milton, Mass.

Proposal for a New Book

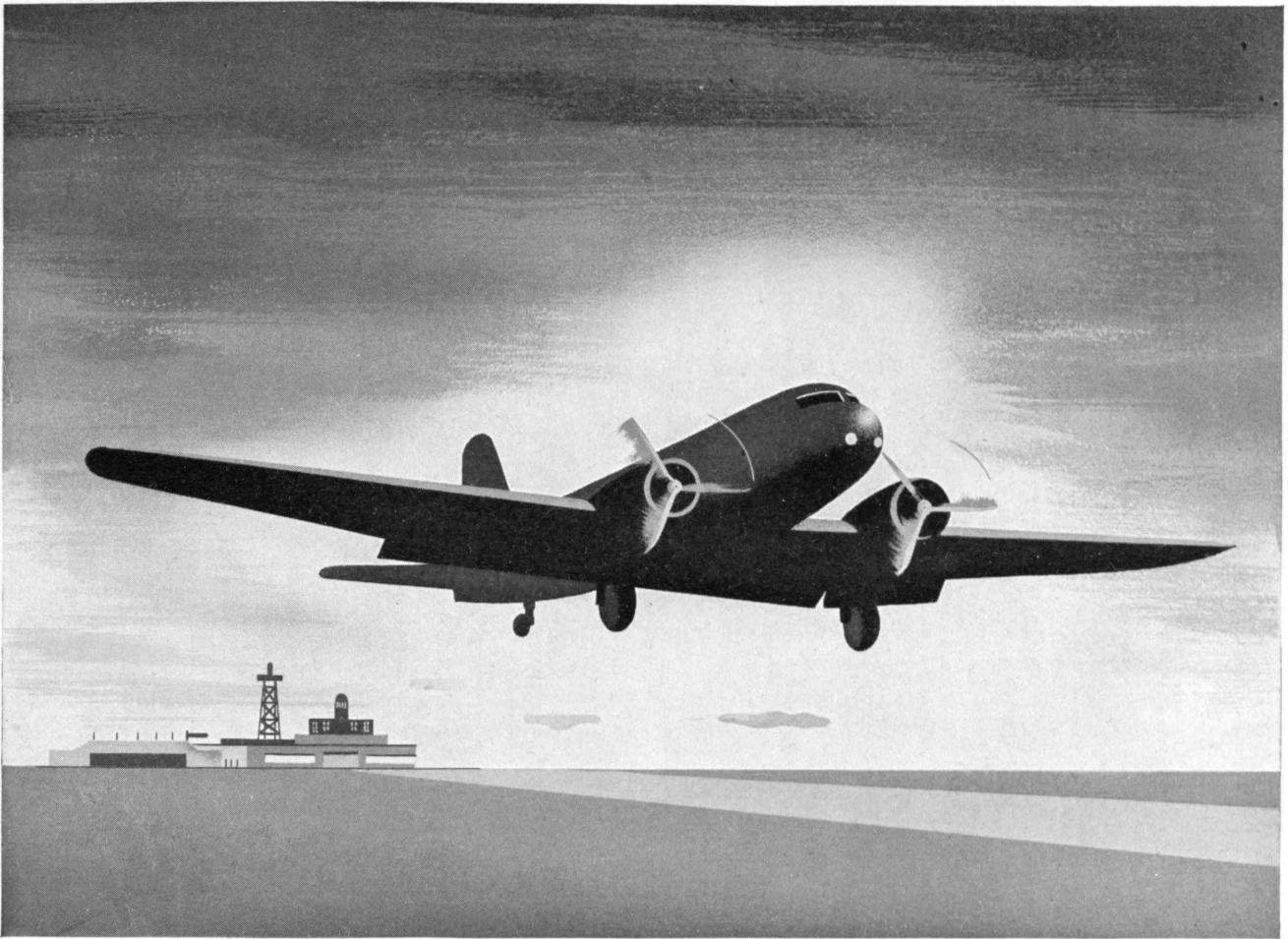
THE author of the following letter prefers to remain anonymous, but both he and *The Review* Editors would like to know whether other readers feel the need for the book he describes and whether they have specific suggestions for its contents and preparation.

FROM A REVIEW READER:

I wish to place before you a suggestion which has been buzzing around in my brain for a long time. With every issue of *The Review*, I am more impressed with the ability of the present *Review* staff to present interesting facets of science to readers who are not familiar with scientific intricacy.

There have, of course, been many books of popular science, but most of them have missed their mark. I think it would be quite possible to frame a book which might be called "Modern Science," or more appositely something else, which would indulge in no more historical survey than seems necessary to lay a background and which would concentrate therefore as Huxley, Tyndall, *et al.*, did in the last century in interpreting to those intelligent enough to understand it, what modern science is doing.

It would obviously be difficult to plan the contents of such a book, but I feel that the present staff of *The Review*, plus one or two obvious augmentations, could lay out a coherent program. I think that with the resources (*Concluded on page 60*)



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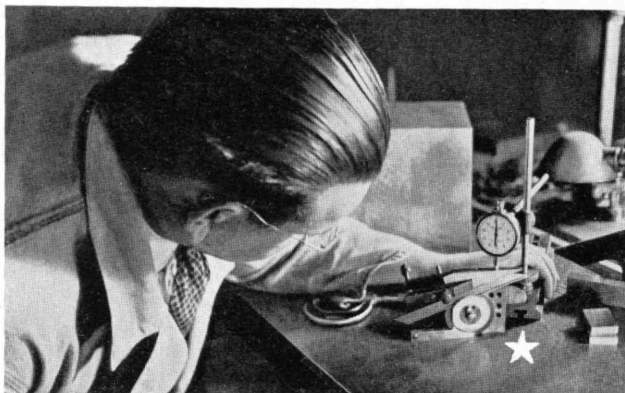
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MAIL RETURNS

(Concluded from page 58)

available to that staff, they could indulge in a swell job of collaboration (a symposium would be deadly, and the book should have the atmosphere of a single writer). Such a book, published by The Technology Press, ought to have sufficient sale to pay for itself, ought to reflect considerable credit on The Press, The Review, the members of The Review staff, and the Institute itself. A leisurely program of a couple of years might be envisioned. . . .

Boston, Mass.

Brain Teasers, Cont.

WINNERS in the November brain-teaser contest for Review subscriptions will be announced in this department next month. The number of replies has been so large that we have not yet finished examining them all.

In the meantime, problem fans may quiet their nerves with the following.

FROM HOWARD M. EDMUNDS, '05:

HOW MANY GIRLS AND HOW MANY DAUGHTERS?

A group of young ladies in a small town meet once a week to embroider a flag for the church. When it is finished, they celebrate the event by having a tea party to which, besides themselves, only the rector is invited. At this function, they all kiss each other, but the rector kisses only those among the girls who are his daughters. There are 109 kisses all told. How many girls were there and how many were daughters of the rector?

THE FIVE RIGHT TRIANGLES

There is one (and only one) set of five right triangles whose sides are all whole numbers and whose areas are all equal. What are they?

(I once saw the answer to this and know positively that it is true. I would much like to know the answer. It is a real twister.)
New York, N. Y.

Homes of Tomorrow

FROM GENE CARY, '33:

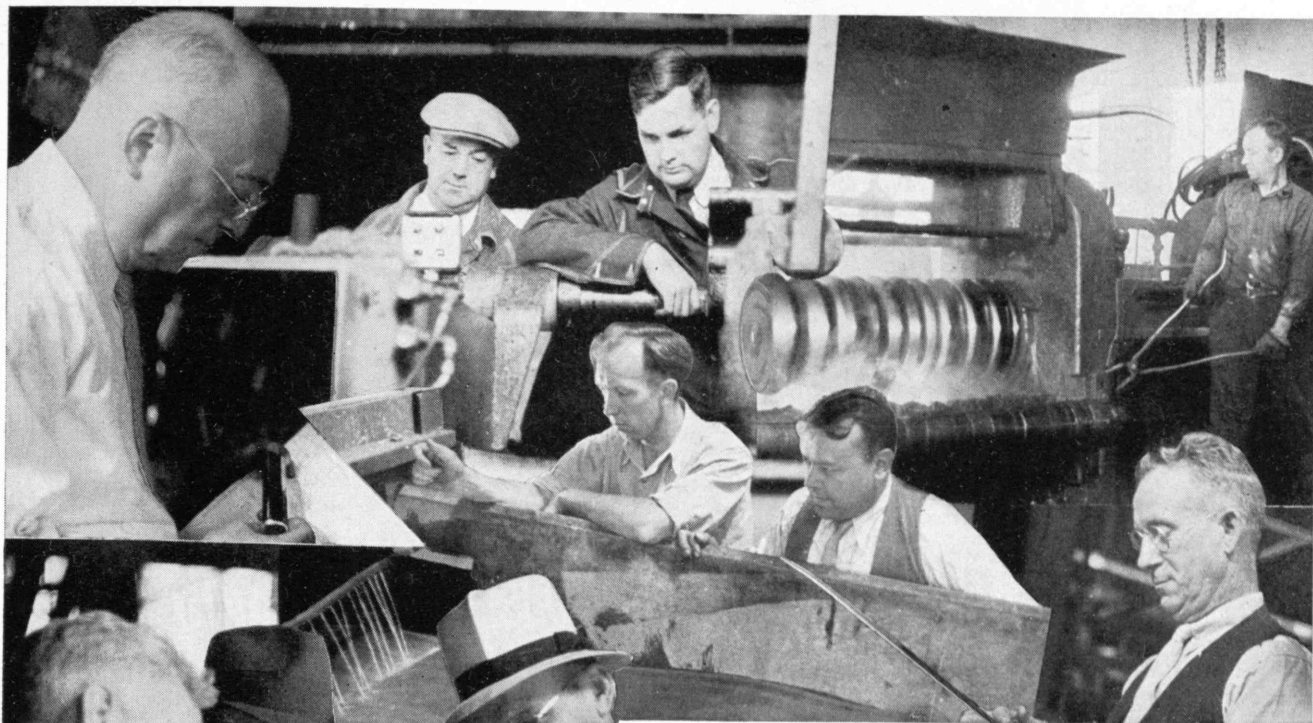
May I congratulate you on publishing the five papers on "Homes of Tomorrow," which were recently presented on Alumni Day. These papers have stirred my imagination more than anything has for many years, and their contents are pertinent to my present business. . . .
Chicago, Ill.

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The highest quality spliced belts averaged only five months' service; composition belts about ten months—and there was continual breaking at the splices due to the heavy overload and bad moisture condition. Shut-downs due to splice failure sometimes occurred at intervals as frequent as four hours.

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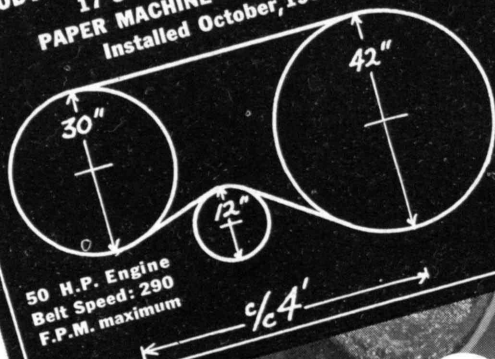
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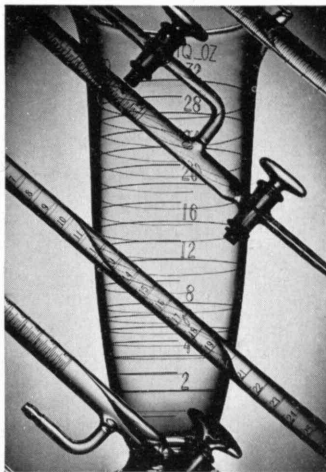
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Fred G. Korth

THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 40, NO. 2

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THESE ARE AUTOMOBILE CAMSHAFTS

THE TECHNOLOGY REVIEW

Vol. 40, No. 2



December, 1937

The Trend of Affairs

P. E.'s Whiskers

AN interesting paper by Paul and Mary Eaton in a recent number of *Science* discusses a matter about which many of us have probably wondered in a lazy and half-hearted way. But with most of us the question has arisen before breakfast when we have had other things to do or have been eager to get at the orange juice and coffee, devoid of the determination to experiment. What is the effect of temperature upon the rate of growth of a man's whiskers? The Eatons, not content to speculate upon the matter, have made it the subject of a systematic experimental investigation. They have devised a technique which has insured a sufficient precision in their results, and have dealt adequately with the statistical difficulties which are significant in all biological measurements. They have been fortunate in securing the coöperation of a subject for their tests — a human guinea pig — whom they describe anonymously — or practically anonymously — as "the subject, P. E., a florid male, *aetatis* 59."

"The crop, harvested with one stroke of a straight razor from an area of about one square inch on the right cheek immediately in front of the ear, was washed free from soap, dried, and mounted. On each slide selected for measurement, 100 hairs chosen at random were measured with an ocular micrometer. From each month's samples, ten were selected for measurement — usually, the first, second, and third, the 11th, 12th, and 13th, the 21st, 22d, 23d, and 24th. Each daily value was linked with the average temperature of the preceding day, as furnished by the United States Weather Bureau."

A few of the results — mean temperature for the month and mean, measured daily growth of the whiskers — were as follows: January, 58 degrees, 0.305 millimeters; April, 70 degrees, 0.458 millimeters; July, 83 degrees, 0.533 millimeters; September, 79 degrees, 0.545

millimeters; December, 60 degrees, 0.375 millimeters, and so on. It appears that the warmer the weather, the faster the whiskers grow. "A 'scatter diagram' constructed from the individual daily measurements shows a very interesting break in the regression line at about 65 degrees F., a temperature which ordinarily calls for heating of homes and office buildings."

The authors do not state whether the subject was shaved with an old-fashioned razor, stropped, perhaps, upon the palm of the hand of the florid male, or with a more modern safety razor, equipped with old blades or with blades which were factory fresh. These factors would certainly have some influence on the magnitude of the experimental results. The facts that a straight razor is mentioned and that soap was used indicate, at any rate, that the shaving was not done with one of the ultra-modern electric shavers. Further, the authors fail to tell what shaving soap was used, and this is a circumstance which might have a considerable effect upon that reproducibility of results which is held to be so important in all scientific work.

The whole atmosphere of the paper is coldly impersonal. The authors modestly refrain from discussing the implications of their data. They do not point out that the Eskimo of the frozen North has no whiskers at all, for they are aware, no doubt, that neither has the black man of equatorial Africa. The philosophic reader may make his own inferences.

Graduation from Gutenberg

ONE of the ironies of invention is the fact that devices which when first produced speed up man's work may later act as brakes to keep him from getting along still faster. In the craft of printing, and all the varied industries and social functions which stem from it, a situation of this sort is developing because of the



Eugene Hutchinson

APOLLO CHARMED THE SAVAGE BEASTS

... and it is that incident that Sidney B. Waugh, '27, depicts on this lovely vase of Steuben glass. In a delicate miniature frieze we see Apollo flanked by two highly stylized wolves, these three figures completing the circumference of the vase.

Along with the spectacular achievements of the modern glass-maker, such as the 200-inch telescope mirror, glass bricks, glass yarn, glass insulation, better food containers (see page 71), casehardened glass, it is pleasant to observe the increasing skill of a growing number of artists in exploiting the artistic possibilities of glass. The Apollo vase above and the objects opposite are samples of this growing competence in glass design

fact that movable type, whose invention has been declared the greatest single agency in the emancipation of the intellect, is hard put to it to keep up with the increasing demand for speed. Printing by means of letterpress composition, which means setting copy into type either by hand or by means of a typesetting machine, and then printing directly from the type or from a plate which reproduces the type, is a process consisting of many separate steps, some of which are necessarily slow. The composition itself is involved; preparing the forms — or units of assembled type — from which the plates are to be cast, is slow; and the printing process itself is not so fast as new conditions may demand.

For these reasons and for the greater reason that increased speed in printing may well mean greater circulation, many printers and publishers are looking ahead with avidity to the day when the number of operations required to transform manuscript copy to printing plates will be reduced, with acceptable results.

The most immediate opportunity to simplify the printing process is to avoid the mechanical composition of type. Letterpress or planographic plates made photographically from typewritten copy are already common but are often undesirable because of the difficulty encountered in getting an even right-hand margin in typewritten material, and because of the relative lack of beauty and distinctiveness in the type faces available. The problem of the margin may be met, albeit awkwardly, by making a typewritten copy of the manuscript, and from that copy calculating the spacing necessary in each individual line to produce an even margin, and then retyping according to the calculation to make the master copy which is to be photographed. Such a process is of course long and expensive. Varying the spacing of the line in proportion to the space occupied by the letters in it is one way of meeting the difficulty; another is the use of stretchable paper, which is drawn out with tweezers, line by line, to an even margin after the text has been typed. The tediousness of these methods has resulted in the development of variable-spacing and proportional-escapement typewriters, which thus indirectly achieve the "justification" of the typesetting machines.

The second criticism of typescript — that it lacks beauty and variety — also is being met by one of these new typewriters. This, equipped with a proportional escapement which compensates for the variation in width of characters by spacing accordingly, is equipped also with a type face which resembles that of printing.

Even with these new aids, however, the photographic production of plates, particularly planographic plates, from copy typewritten on paper still faces the charge of being at best a roundabout method, involving one unnecessary step. Accusers who argue this case are the experimenters with photocomposition, whose aim is to perfect means for the direct production of the essential film. Photography of the characters from matrices or transparent assemblies, rather than photography of typed copy, is of course a swifter and hence more economical process. If the letters, instead of being typewritten on paper and then photographed, can be photographed directly during the composition of a page, and if, from the resulting film, a planographic plate can be

made, the printing art and its allied industries may well undergo changes fully as revolutionary as those involved in the invention of movable type.

In both America and Europe, investigation of this possibility has been under way for some years; though still in rudimentary stages, it has led to several interesting results. Means of converting the conventional linotype to photocomposition have been patented by American inventors. They substitute transparent matrices bearing photographable characters for the conventional matrices bearing character dies, and substitute a camera for the conventional pot of molten metal. When a line of matrices has been assembled by the usual manipulation of the linotype keyboard, it is photographed, and the matrices thereafter are distributed, ready for a second use.

In Europe the most noteworthy progress thus far has been made in development of the Uhertype, the work of Edmond Uher, Jr., of Augsburg, Germany, and various collaborators. The Uhertype system consists essentially of a more radical conversion of the linotype, in which an assembly of matrixlike slugs is made to control, through feeler rods operating on key surfaces and in slots, the position of a transparent glass screen carrying a set of characters. The line of matrices having been assembled, the glass screen moves, under control, in such wise as to bring characters represented by the matrices one by one into a beam of light, or to deflect the light beam through them in succession, so that they may be photographed on a moving strip of film. Methods of assembling strips of film to make up pages, reproducing cameras for use in the preparation of plates, and systems of justifying are among other results of the Uher group's work.

Final perfection of photocomposition, aside from the fundamental shifts it will bring in the printing trades, may be expected to increase demands for film and for photographic paper to a degree hard to reckon. Though that perfection may be a very long distance away, a survey of the present state of the art seems to justify the assertion made by the Uher group in diagrams and drawings which show an assembly of photographed type reading: "*Priscae artis opus infantium ludos vides.*" This cryptic sentence may be rendered rather freely to read: "Thou seest the work of an ancient art the pastimes of children."

Certainly an impetus to photocomposition comes from the growing use of the microfilm method for photographically recording information. Seers already are forecasting whole libraries on film rather than on paper.

Bauhaus Background

THE recent establishment of the New Bauhaus, a school of design, under the direction of Laszlo Moholy-Nagy in Chicago has rightly occasioned considerable comment in our press. Inasmuch as there are in America at the present time a number of other distinguished personalities of the ill-fated German Bauhaus, and inasmuch as the stories of the new school seem to have suffered some misconceptions as to the German institution, it seems proper for The Review to give to its readers some orientation in this important movement and some explanation of its relation to architecture and the arts.

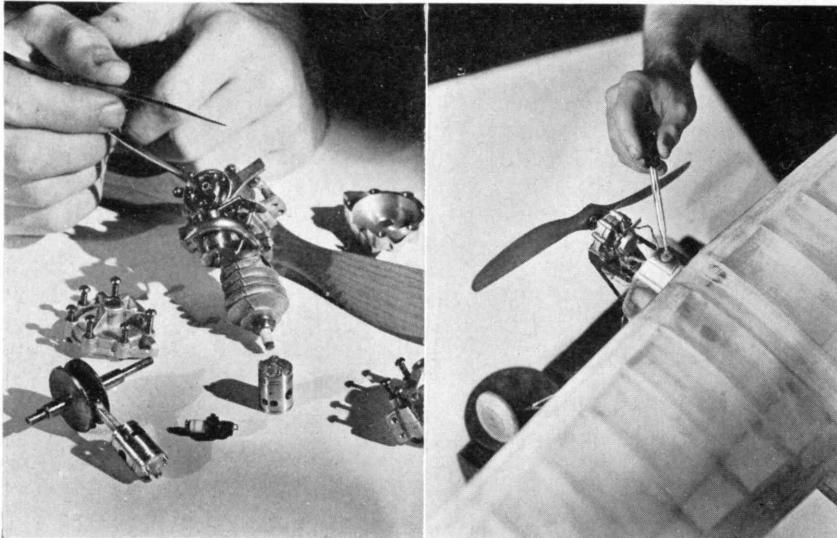


Paul J. Woolf

FOR THE CHRISTMAS SEASON

Leerdam Crystal: Madonna and bowl

Prior to any organization of the Bauhaus by Walter Gropius, now professor of architecture at Harvard, there had been in Germany *Werkbund* movements, that is, movements in which a number of artists of various specialized talents associated themselves in rather close collaboration. It must not be forgotten that Socialist Germany was in a ferment. Doctors, lawyers, men of all professions whose lives had been more or less uprooted



A. J. Baker

2.8 POUNDS PER BRAKE H.P.

Refueling the world's smallest gasoline-powered airplane engine—shown in its assembly line in outer photograph. This Lilliputian counterpart of the Wasp, Hornet, and Cyclone, designed by Dan Calkin, '31, weighs four ounces, develops a maximum horsepower of 0.035 at 4,700 revolutions per minute. Its best fuel economy is 2.8 pounds per brake horsepower at 3,500 revolutions per minute, at which speed it runs approximately 40 minutes on one ounce of fuel

were questioning the validity of their previous work and often seeking utterly new and different outlets for their activity. In that atmosphere Gropius, a practicing architect, set up his Bauhaus in Weimar, city of Goethe, important center of Thuringia.

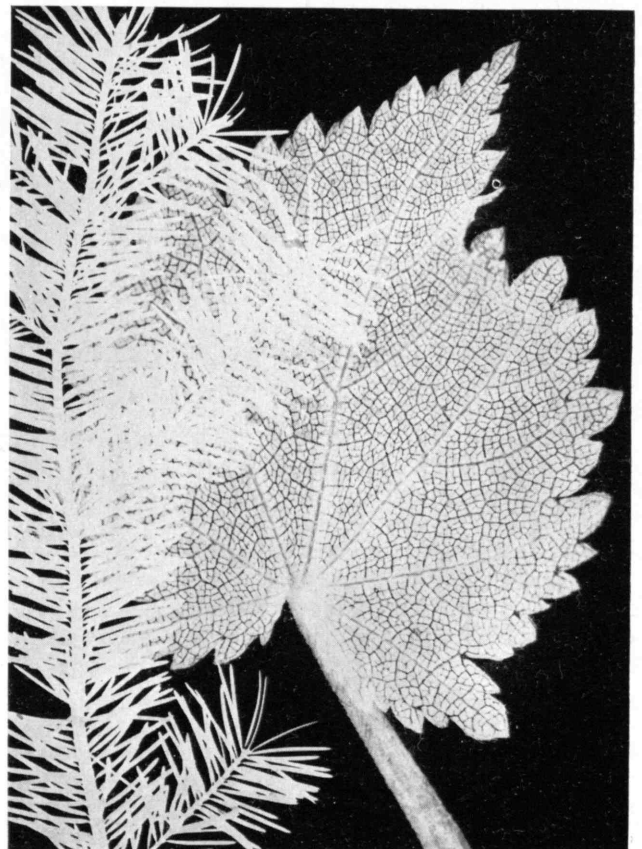
At first the Bauhaus was pretty clearly not a school but rather an association of artists and apprentice artists. To it came diverse personalities and nationalities; for example, Moholy-Nagy and Marcel Breuer, Hungarians; Alexander Schawinsky, a Swiss Pole; Josef Albers, a Westphalian. Some were middle-aged, some very young. Albers had long been a teacher of painting; Breuer was a youth who had spent one day in the Academy of Vienna and found it hollow. The Bauhaus at this time had a spirit of independent work — so independent that those who might loosely be called students often worked against their teachers. Gropius was the only architect, and architecture was by no means the group's primary concern. During this period when the Bauhaus was more a group than a school, the students often had as much influence as the teachers. For example, at the age of 22 years, Breuer, then a student — before the Bauhaus moved to Dessau in 1925 — had already taken over the work in interior architecture.

Why did the Bauhaus move to Dessau? Politics. Thuringia, it may be recalled, has always been a Rightist province. The Nazi movement was strong there long before it reached Berlin. The sober burghers of Weimar looked upon the Bauhaus as revolutionary: It had been created under a socialist government and was, therefore, in their minds, subversive, even though there was no record of actual revolutionary activity. Hence the atmosphere in Weimar was not congenial. Meanwhile, the town of Dessau, more liberal in its attitude, saw and grasped the opportunity. To Gropius it made an offer. The town supplied financing; Gropius designed and built possibly his most famous building; and the Bauhaus came to Dessau.

When it came to Dessau this group had already become something more of a school. Many of the prominent spirits in the Bauhaus were more interested in practice than in teaching, and by 1928 the school had developed far enough so that Gropius thought he could

return to practice. He left it in what seemed the promising hands of Hannes Meyer. When Gropius departed, with him went Breuer and Moholy-Nagy.

By 1930 it began to be evident that Meyer was not conducting the Bauhaus along the lines projected. An effort was made to save it as an effective school, and to its direction was summoned Mies van der Rohe, already a well-known and established architect with a good reputation. Within two years the Nazi Government, which had never favored revolutionary ideas in design, had closed the Bauhaus at Dessau for good. Mies tried to revive the idea in Berlin, but this effort was stillborn.



Neustadt from Black Star

Meanwhile the workers in the Bauhaus had scattered. Some were working in Switzerland, some in Hungary, some in Italy. Wherever fascism prevailed, the ideas of these artists were not met with full sympathy, though the Italian atmosphere seems to have been more sympathetic than the German. Gradually many of them arrived in England, often in partnership with English architects — Gropius with Fry, Breuer with Yorke. Today most of them are practicing in this country.

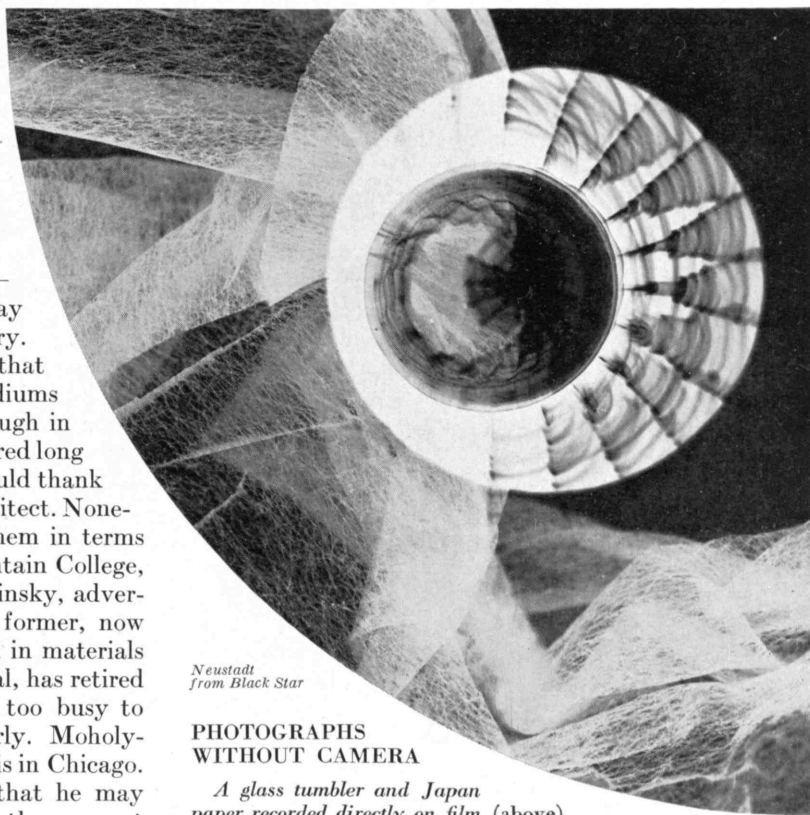
It must be remembered of the Bauhaus that the men who first worked in specialized mediums all became architects if they did well enough in their preliminary work and if they persevered long enough. Thus no leader of the Bauhaus would thank you if you did not recognize him as an architect. Nonetheless, it is rather easier for us to tag them in terms of their specialties. Today at Black Mountain College, N. C., are Albers, the painter, and Schawinsky, advertising painter and stage designer. The former, now mature, has been giving general education in materials and arts; the latter, young, temperamental, has retired temporarily from a life which he found too busy to allow him to orient his philosophy clearly. Moholy-Nagy, middle-aged painter, photographer, is in Chicago. The prospectus of his school indicates that he may seek at some time to train architects; for the moment it is quite enough to consider the new venture rather as a school of design. Breuer, young furniture designer, interior decorator — in charge of carpentry, as well, at the Bauhaus — will, on his return from England after the first of the year, be associated with Gropius at Harvard, and will seek practice in this country. Mies van der Rohe, in his fifties, is here working on a specific commission and possibly hopes to stay. Meyer is expected shortly.

It is hardly necessary to dwell at any length on the significance of this hegira. It suggests things about the political air we breathe. It suggests things about what men of this sort think of the opportunities offered by America. It suggests many questions as to what impact they may or may not have on American art life and art forms.

Meanwhile, there are a few outstanding young men in Europe who can bear watching and who have not joined the exodus. None of these is a Bauhaus product. For close American attention during the next decade, The Review hereby nominates Ivar Aalto of Aabo, Finland; Louis Sert, a Spanish *émigré* now in Paris; and Werner Moser in Zurich. These men, in their thirties, have to a degree — Aalto to a considerable degree — arrived in Europe. To watch their progress as compared with that of their transplanted brother artists should be an amusing and instructive occupation.

Pinchless Shoes

A METHOD of treating leather has been lately reported, which apparently allows this material to stretch almost like rubber without losing that unique combination of properties that keeps it irreplaceable.



*Neustadt
from Black Star*

PHOTOGRAPHS WITHOUT CAMERA

*A glass tumbler and Japan
paper recorded directly on film (above).
Lime-tree leaves and pine branches (opposite page)*

Skin, tanned and prepared in the usual fashion, is subjected to a chemical process which dissolves the tanning agent and impregnates the leather with a lubricating substance. The greatly increased flexibility thus imparted is not accompanied, it is claimed, by lessened resistance to deterioration. Leather so treated is cemented to an elastic woven material and in this state will stretch up to 50 per cent.

In addition to its use in snugly fitting shoes which require neither buckles nor laces, it is suggested that this leather could be made into unusually comfortable riding breeches, hunting jackets, and corsets.

The Campaign against Pneumonia

THE group of related ills which the layman lumps under the general name "pneumonia" is among the most expensive to treat and among the most deadly of the diseases to which human flesh is heir. As causes of mortality, these are outranked in the death registration area of the United States only by diseases of the heart and by cancer. They strike strongly among people in the most productive years of life. Moreover, they exceed the communicable diseases of childhood as sources of invalidism and death. For the reasons implicit in these conditions, effort to control the pneumonias has come more and more to be regarded as a community problem.

The work of public health agencies and public health workers has been basic in past progress toward control of the disease, especially in the study of the pneumococcus, which had been established in 1886 as the etiological factor of lobar pneumonia in man. Thirty-two types of

the pneumococcus have been distinguished, two of which are responsible for about half of all cases of the disease.

Serum developed in horses has, in recent years, been put to work successfully in treatment of the disease under conditions of general medical practice. Most recently, indications have been that serum from rabbits has definite biologic advantages over horse serums. For maximum effectiveness the required amount of serum must be administered to the patient within the shortest possible time. It becomes imperative, therefore, that the type of disease in question be early recognized, and development of technics of rapid determination has been among the most important forward steps in the search for methods of control. It is particularly in this aspect of the campaign that public effort becomes so important.

Once the serum has been made available, its administration is a very technical matter, demanding expert knowledge. This fact renders highly desirable the establishment of consulting services in addition to the quick diagnostic laboratory service necessary to ensure early determination of types.

Under way in New York City at present, where pneumonia causes some 7,000 deaths each year, is a vigorous campaign embodying the suggestions summarized above, which are those of a special subcommittee of the New York Academy of Medicine. Another attack on the disease is being carried on in C.C.C. camps in the First and Ninth Corps areas, where, under the supervision of

the Army medical corps, pneumonia-prevention vaccine is being tested through injections given to volunteers. This vaccine, developed by Lloyd Felton of the Johns Hopkins Hospital in Baltimore, is believed to act as a preventative of the two most incident types of pneumonia. Army doctors do not maintain that the vaccine is a definite answer to the problem but have found encouraging earlier experiments in C.C.C. camps.

Air Conditioning Hits the Water Works

A RATHER neat illustration of why city planners should be recruited only from the ranks of the major prophets is contained in a recent talk delivered by L. D. Gayton, city engineer of Chicago, to the Illinois section of the American Water Works Association.

The bulk of the air-conditioning apparatus in the central business district of Chicago does not use water-conserving equipment, but it does require a maximum of thirty-five million gallons of water per day for cooling purposes. If no water-conserving devices are installed, it appears that this maximum will grow to as much as 295,000,000 gallons per day within 20 years. Apparently the city fathers were not aware of the future of air conditioning when the water system was planned, for while a sufficient supply of water for the Chicago Loop area is available for about ten years, the present sewers are already unable to bear adequately the maximum load which the air-conditioning equipment puts on them.



Study for photomural by Paul J. Woolf

12,000,000,000 Tin Cans

. . . *Which Some Day May Not Be Tin. The Story of Appertizing — a Word which Should Be Bracketed with Appetizing in the Lexicon of Food*

BY JOHN E. BURCHARD

AMERICAN canmakers now produce twelve billion cans annually. That is a lot of cans. It would take more than five Empire State buildings to warehouse them. If you should lay them edge to edge and end to end, they would completely cover an 80-foot highway extending from Atlantic to Pacific; if you should place them similarly but on the periphery of a circle, they would line a four-foot shaft through the earth from one pole to the other pole. That is, you will agree, a lot of cans.

It means, for example, 100 cans for each man, woman, and child of us; not a hundred tins of food, be it hastened to say, for today's can business pours about 40% of its output into other lines — into tobacco, oil, paint, shoe polish, aspirin, adhesive tape, moth balls, stamp pads, to name only a few. Nevertheless, it was with the food-preserving art that the industry began, and it is in terms of food preservation that it must still be discussed.

The growth of this industry, which in 1933 used more steel than buildings, than railroads, than any steel customer except the motor industry, is one of 150 years, of which the last 40 have seen the greater acceleration. It is an industry based on research in its formative period and was to a degree peculiarly free from exceptional recent research until current developments began to blow a blast of air through it. Development divides rather exactly into two phases: The first was one almost exclusively in bacteriology and chemistry, and this came to a sort of close in 1898. The second phase, which dates from the first consolidation of canmakers, was one of mechanical and engineering achievement, although of course there has been a deal of mopping up and refining in the older fields of study and at least one outstanding discovery during the period when the bacteriologists had relinquished the ball to the engineers. Today, largely

THE SAGA OF A GREAT INDUSTRY, Sired by Science and Reared by Engineering. How an Obscure Frenchman Started It, Two American Biologists Took the Bugs Out, and Mechanical Engineers Are Making It the Apotheosis of Mass Production

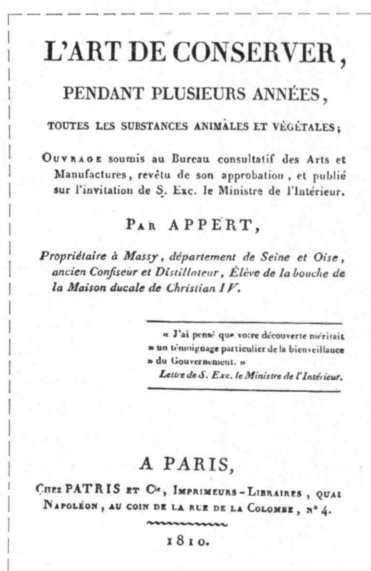
because of a supreme achievement of the engineers, there is promise for new developments in the older field, but that part of the story can be understood only after the background is known.

It all began with a very great scientist, Nicolas Appert, who would be even more obscure than he is had not an American, A. W.

Bitting, recently called attention to his achievements. Appert, the son of a wool carder, was born in the exact middle of the 18th Century. He gravitated into work with foods at an early age and by 1795, when his opportunity came, he was quite ready to assume his destined role as the father of modern canning. In this year the food situation all over Europe was horrible. Navies suffered constantly from scurvy; armies and civilians from malnutrition. The French government, first to feel the need of doing something about it, offered a prize for an improved method of preserving food. The prize interested Appert, and he had a solution by 1804.

In comprehending the magnitude of Appert's achievement, it is necessary to have a clear idea of the state of scientific knowledge of the time. Bacteriology, we must recall, was really unknown, though Leeuwenhoek in the 17th Century and Müller in the 18th had made some preliminary observations. Spontaneous generation was still a common theory; so great a scientist as Gay-Lussac thought he could produce fermentation in grape juice by plunging the two wires of a galvanic pile into it without contact of air. Pasteur and Cohn, the parallel founders of bacteriology, were not to be born for 25 years. Not much greater was the knowledge of the sort of chemistry which might have been helpful. Appert, moreover, had little access to such information and misinformation as did exist, which may have helped more than it hurt him.

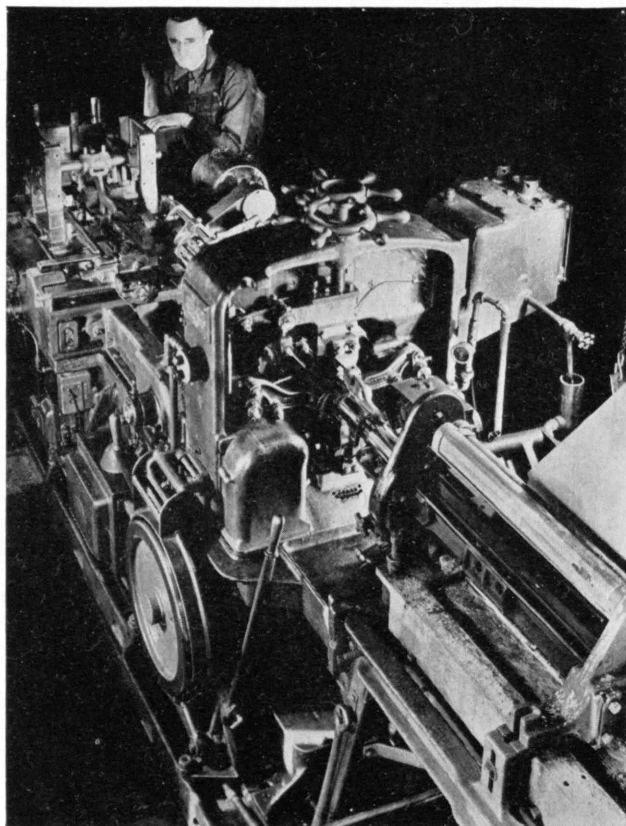
The work of any outstanding scientist is not likely to be the result of blinding discovery. Almost any his-



TITLE PAGE

. . . of an industry as well as a book. Nicolas Appert, founder of modern canning of foods, first published his discoveries under this title in 1810. The modern way of safeguarding milk might, with more justice, be called appertization rather than pasteurization

torical detective can find predecessors to the man who has received credit; all too often the detective uses this knowledge to try to break down the greater man's reputation. Appert is no exception. In 1782, for example, Scheele, a Swede, had advocated the conservation of vinegar by heating it in a well-tinned marmite or in bottles in a kettle of water, boiling it for a quarter of a minute, and covering with a layer of oil. This of course was the correct principle, but it was carried no further and was not even known to Appert. At any rate, he not only applied the method to all sorts of foods but did so in a way which preserved their edible qualities. What he did was to put food in glass bottles, heat them to the boiling point of water, and then hermetically seal the containers. It sounds very simple. It was not simple. The facts of science were not at our man's disposal; no more were the tools. In addition to determining temperatures and times, he had to create new bottles and closures as well, for the old bottles were the wrong shapes and sizes, and the closures were not calculated to keep the food from air contamination. But he prevailed. By 1804 he was able to send specimens to the minister of marine who, in turn, transmitted them to the board of health at Brest for testing. The report was favorable. Two years later food preserved by Appert was successfully shipped across the equator.



American Can Company

CANNING MACHINERY

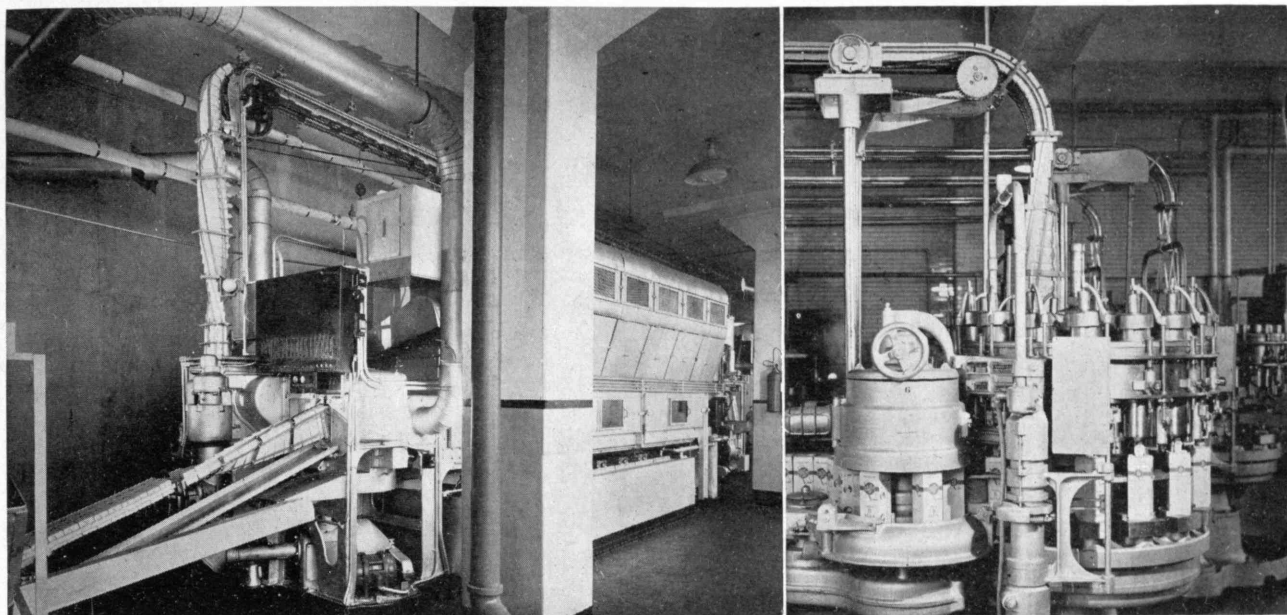
... represents superb engineering achievement. On the cover of this issue is shown a battery of rotary testing machines which automatically check the airtightness of cans. Above is the noisiest and most dramatic of the can machines — the roll-form body-maker which takes flat sheets of tin, whisks them around a cylindrical mandrel, lock-seams them, solders them with mechanical fingers, and turns them out as cans at the rate of 300 a minute

Even as early as 1805 Grimod de La Reynière, a fluent and sparkling writer on gastronomy, who could be caustic as well, wrote in his *Almanach des Gourmands*: "In each bottle and at slight cost is a bounteous *entremets* that recalls the month of May in the heart of winter, and often deceives when it is dressed by a skillful cook." By 1809 Appert's food was so popular that the *Courier de l'Europe* uttered this panegyric: "M. Appert has discovered the art of fixing the seasons. With him spring, summer, and autumn exist in bottles like delicate plants that are protected by the gardener under a dome of glass against the intemperance of the seasons."

Appert had arrived. He had arrived to such an extent that in 1810 he was persuaded to publish his work that all might use it. For this publication he received a prize of 12,000 francs. We may realize how important this treatise seemed to the world when we learn that it was translated into German by the chief pharmacist of the Coblenz General Hospital the year of its publication, into English in 1811, while an American edition appeared in 1812. There were seven editions in French alone. With publication of course came criticism. The little book stimulated the redoubtable, educated, urbane editors of the *Edinburgh Review* of 1814 to a large essay. This paper, an excellent sample of a great period of English letters, is good reading. The Edinburghers did not on the whole think much of Appert's work. They suggested that the other then known methods of food preservation, such as freezing, desiccation, and exclusion of air, were all more promising. They went on to elaborate what we now can see to be an utterly ridiculous theory as to why Appert's method worked at all. To him they allotted the scant credit which might be given a passable engineer who had made a minor improvement. Thus do revolutions often seem to those in the center of them.

Nor was this all. A host of counterclaimants arose. This always happens and as usual these *post hoc* thinkers were finally relegated to their proper places. More harmful to progress was the attitude of science. Gay-Lussac, one of the spokesmen of the scientific pundits, undertook, for example, to explain Appert's results. His explanation is worth repeating as a sort of scouring rod for any overconfident modern scientist. Gay-Lussac said: "Vegetable or animal substances through their contact with air acquire immediately a disposition to putrefaction or fermentation; but in exposing them to the temperature of boiling water in vessels well closed, the absorbed oxygen produces a new combination which is no longer able to excite fermentation or putrefaction when it becomes concrete by heat in the same way as albumen." Appert's own explanation was much simpler and nearer the truth.

It is all too easy to make fun of the Edinburghers and of Gay-Lussac in the light of today's knowledge. Today we think we know why food spoils. A substance, in order to be a food material, apparently must be decomposable under the attack of a living organism or its enzymes and, in general, decomposition is due to the development of living organisms within the food. Therefore food will not spoil so long as all living things that might feed upon and thus alter it are either kept out or prevented from developing. On this basis freezing, for example, arrests development so long as the food stays frozen, for few or-



American Can Company

PAPER MILK BOTTLES

American Can has gone down a new alley in developing a rectangular fiber container for daily deliveries of fresh milk. Left. The oven in the container line where the bottles are coated with paraffin. Right. Filling the rectangular containers with milk

ganisms are active at low temperatures. When frozen foods thaw, they have within them all the potential agencies for destruction with which they came to the freezer, for destructive organisms are generally not killed by freezing but rather kept in a state of suspended animation. Drying removes water elements which the organism must have in order to function, while preservation by chemicals makes the habitat unsalutary. Finally, heating may actually kill the organisms and if, subsequent to the heating, the food is guarded from contamination, spoilage may be postponed indefinitely. There is great promise in present developments in freezing, notably quick freezing, and in advances in desiccation, but these are not part of the canmakers' picture and hence not a part of this story. Appert had, perhaps by accident, hit upon the one method which, in view of the other technological potentials of the period, was best calculated to spread rapidly and widely.

With his 12,000 francs, Appert established a factory where he never ceased experimenting till the day of his death. He prepared many different foods. He extracted gelatin from bones without the use of acid, made bouillon cubes, dared to experiment with the autoclave when it was a very dangerous instrument indeed. He even tried some tin cans, but the French in his day were poor artisans in tin, so he went over to wrought-iron casseroles which he tin-plated. Nonetheless, he developed the three shapes of tins, round, rectangular, and oval, which are the principal shapes of today. He worked with the preservation of wine and beer and achieved a method for temporarily preserving milk so that it might reach an urban market. Pasteur himself acknowledged the debt which the world owes to Appert and in no uncertain terms: "When I published the results of my experiments on the possible conservation of wine by preliminary heating it was evident that I only made a new application of the method of Appert but I was absolutely ig-

norant that Appert had devised this same application a long time before me. It is however this expert manufacturer, who, the first, indicated the possibility of conserving wine through the preliminary application of heat." Only minor modifications of Appert's process exist in the modern method by which we prepare milk, a process which, ironically enough, we call pasteurization, not appertization.

Pasteur was great enough so that he could afford to be generous and great enough to be generous. His own contribution to the canmaker was significant enough. During the middle of the 19th Century his observation of bacteria indicated why Appert's cooking had quite often been successful in preserving food. But Pasteur went much further. He explained the sporeformers, those bacteria which from time to time go into hiding and which, while in spore form, cannot be killed by heat. To circumvent this difficulty, Pasteur contrived a process of discontinuous sterilization, which allowed the pack to rest for 15 hours or so between heatings. This permitted those bacteria which were in spore to reassume their vegetative or active state during the rest period, after which they could be killed by the next application of heat. Three such heatings were usually sufficient, but sometimes four were necessary. This method is often still used by home canners and, if literally followed, is perfectly satisfactory, but it is of course not very practical for modern high-speed canning.

Canning began to grow almost at once with Appert's discovery. Soon a young Englishman, who had learned the art in the firm of Crosse and Blackwell, came to America, determined to set up a cannery on the Appert principle. Landing in New Orleans, this founder of American canning, William Underwood, deliberately walked from New Orleans to Boston, that he might personally observe possible sites for his enterprise. Deciding upon Boston, he established his house in 1821,

using the glass jars which were favored by Appert. By 1840 tin cans had largely displaced the glass jars,* and, due to Pasteur's observations, spoilage was less common. Soon it was recognized that higher temperatures killed faster. In seeking such temperatures the first efforts were to use open chemical baths with boiling points higher than that of water. This caused much bursting of cans. By 1870, however, this had been abandoned in favor of the now safe pressure cooker, or autoclave, in which steam at higher pressures produced correspondingly higher temperatures. And so the canning industry went on developing, becoming bigger every day until the middle Nineties.

By 1895 the industry was no small one. America was canning about eighty million cans each of sardines, salmon, and corn, and perhaps one hundred and twenty million cans of tomatoes. Although there were many failures, they were accepted as the inherent hazards of a profitable industry. But now the industry had risen to such proportions that failures were becoming serious. As is so often true in science, three groups of investigators arrived at somewhat similar conclusions, independently and almost simultaneously: Harry Lyman Russell in the Wisconsin Agricultural Station and the Canadian, Sir Andrew MacPhail, one of those brilliant combinations of scientist and *littérateur* occasionally produced by English-speaking peoples, hit upon some of the same results as two Technology investigators, the late William Lyman Underwood, '98, grandson of the cannery founder, and Samuel C. Prescott, '94, now Dean of Science at Technology.

The work of Prescott and Underwood was outstanding in its comprehensiveness, in its accuracy, and in its fundamental nature. Dr. Prescott summed up their philosophy when he said: "I can see no reason why the knowledge of the fundamental principles should not be sought just as eagerly in the preservation of food as in any other branch of manufacture." There is no question but that the three classic papers of these two M.I.T. men in the years 1895 to 1898 marked the most important step since Pasteur. A great deal of spoilage at this time was associated with the formation of gas within the can, and consequent bulging. Isolating a number of bacilli and micrococci from such packs and inoculating sterile packs with the cultures, the investigators were able to produce the same phenomenon. They established conclusively that several of these organisms were anaerobic. They showed that corn was a good insulator against heat and that there was a serious lag in temperature between that at the outside of the corn and at the center. They established, further, that heating *all* the contents for ten minutes would sterilize the pack. They laid the ghost of the use of antiseptic preservatives and settled the hash of Pasteur's repetitive sterilization, substituting for it the superheating which is now used. Finally, they provided criteria which have served the canner ever since.

Since the work of Prescott and Underwood, there has been one established scientific discovery. That was made in 1913 by Bronson Barlow who detected forms of bacteria which, unlike all others, are dormant at normal

* This is the story of the can, not the glass jar; some day The Review hopes to describe the huge glass container industry.

temperatures but active at the high temperatures associated with sterilization. The end result of this work has been that canners now make sure that they cool the pack rapidly enough so that any existing heat lovers, or thermophiles, are quickly rendered dormant by the return to room temperature. Following this work, there have been many minor advances, and they are still being made. A modern book on canning practice, for example, discusses individually, specifically, and in detail the processes of canning 41 kinds of fruit and a corresponding number of vegetables, specialties, and meat. Each article of food is subjected to slightly different processing which does not, however, depart from the fundamentals laid down by Appert, Pasteur, and Prescott.

IN 1899, one year after the third of the classic Technology papers, the great consolidation of 123 of the then existing 175 American canmaking companies was conceived. The plan was executed in 1900. This great coalition, which at the time had over 90% of the tin-can capacity of the nation, was the American Can Company. More recently but still long enough ago to have developed a history, the union of Continental and United States can companies into a corporation bearing the name of the former brought into the industry a competitor for American Can. Yet in many respects this competition was more apparent than real. *Fortune*, in discussing the younger company a few years ago, uttered one of its characteristic bon mots which about tells the story: "Yet American and Continental are brothers under the tin." The details of what is and what is not competition in canmaking are not germane to this story. The fact is that the developments which have taken place in canning since the turn of the century need not be identified with either company.

If you were to seek any one person with whom to identify them, you might not do better than pick on W. E. Taylor, Vice-President of American, who has been with that company for a long time, who has followed canmaking from the simplest shop to the elaborate plants of today, and who is responsible for many of the major developments. These developments, as has been suggested earlier, have been most significant along the lines of improving the can, improving it in quality, improving it in price, which means improving the methods of manufacture. It is not too much to say, however, that the canmakers have been responsible for every major development in the preservation of food in cans since Prescott's work. In fields which may only be mentioned, they have worked on new methods of processing and on public education. Their progress in improving the container, in improving the methods of packing, and in speeding up production may profitably detain us a little longer.

You may not remember it, but before the War the canning of fruit and vegetable juices was almost unknown. Fruits, sauerkraut, and pickles were canned with trepidation because their acids had a corrosive effect on tin plate, causing hydrogen swells and perforations. One person, as far off the track as Gay-Lussac, attributed the swelling of canned cherries and other similar fruits in the spring to "the natural urge for the pits to swell and sprout at that season of the year." Discoloration of contents was reasonably common. (*Continued on page 100*)

Toward Better Automobiles

A Group of Scientists and Engineers Give Their Answers to the Question: "How Can Today's Car Be Improved?"

Your Opinions Solicited

MANY automobile owners whose interest in cars is deeper than paint and chromium plate, sooner or later come to the conclusion that they and the manufacturer do not always see eye to eye on what constitutes an acceptable vehicle, despite the acknowledged achievements in automotive design. If an owner is more interested in transportation than in a streamline symbol of affluence, then he may wish that the automotive engineer rather than the sales manager might have the final say on what a car should be. Furthermore, if he seeks engineering confirmation, he learns that within reason an automobile which meets his standards of economy, safety, and performance could be built at a cost lower than he now pays for one replete with embellishments and gadgets he does not need or want.

If the driver knocks off his hat nearly every time he gets into his car, he begins to wonder why, even in the interest of eye appeal, it was necessary to build the roof so close to his head. One experience in changing a tire or using the touch system to apply chains under the hooded wheels of the present cars prompts him to question the automotive standard of modesty which suggests that it is indecent for cars to expose their wheels. Such incidents occur in the experience of every driver, and they usually start a critical appraisal in which present standards of performance and design suffer by comparison with what the engineer-minded owner thinks they ought to be.

As reported below, the Editors of *The Review*, aware of this feeling on the part of some drivers, asked a group of scientists and engineers to give their detailed appraisal of today's automobile, and, by inference, their conception of tomorrow's. To supplement their comments and to fill in this picture of tomorrow's car, the Editors would welcome discussion from *Review* readers. After you have read the following article, put on paper your own ideas and send them to The Editor, *The Technology Review*, Cambridge, Mass.

JUST what does the owner, particularly the engineer-owner, think about his present car? What deficiencies did he observe in the new cars at the automobile shows? To get answers to these questions, *The Review* invited 50 scientists and engineers to answer a questionnaire on economy, control, safety, comfort, style, and engineering, and, in addition, to list, with a guarantee of anonymity, their pet criticisms, grouches, or auto-phobias. The quick response, well-considered answers, and heartfelt outpouring of grouches confirmed the editorial conviction that not only do owners have sound criticisms, but they welcome the opportunity to unburden themselves in a frank and constructive manner.

The first topic in the questionnaire concerned economy, and under it were included the original price of the car, operating expenses, cost of repairs and parts, extra equipment and gadgetry. The replies indicate that a majority of those polled feel that present purchase prices are reasonable with the exception that the many unnecessary extras and superficial decorations, such as chromium gewgaws, expensive relief designs in the body or hood, and other eye catchers add needlessly to first costs.

"I want a car sanely cheapened," said one engineer, "gadgeted with moderation, described to me with frankness, and sold without insult to my intelligence." Said another: "Away with gadgets! Cars are beginning to look like Christmas trees." Still others charged that extra equipment in many price classes is becoming something of a racket, that the advertised price of a car does not always include a certain necessary equipment. Another suggested that more manufacturers state the delivered price in local advertising rather than the f.o.b. factory price. There's a difference!

Several owners indicated they were not interested in imitation walnut paneling on instrument boards and combination color schemes in paint and upholstery — both contributing factors to higher costs. "I want a car upon which I can rely to get me and my family there and back safely," said one driver. "I am not interested in a balloon-tired boudoir."

The most severe criticism in the answers on economy, however, was directed not at first cost but at what one owner described as "that mechanical migraine — service station costs for repairs and parts." Indignation over the high costs of repairs, "exorbitant prices for parts and incompetent garage mechanics," was clearly indicated in many replies. "Theoretically the first cost and the cost of repairs is low," ran one answer, "but the theory is blown to pieces by the people who run the service business." "It has taken me eight years to find a reliable garage," said one heavily inked answer. And another: "Poor service stations are common for all makes of cars, except one!"

One owner felt that the effort to produce yearly models has brought about general deterioration in the appearance, life, and safety of modern cars. It was his opinion, as a competent engineer, that "a soundly built automobile in the hands of an intelligent operator, willing to give it reasonable care, should last 25 years." Of course, American economy is so largely based on rapid obsolescence that longer-lived cars might be considered unfortunate.

Several drivers gave it as their conviction that in the low-priced car the man of moderate means gets performance and power which he does not need and for which

the car is not always safely designed. There were other criticisms on economy, including the opinion that manufacturers generally do not incorporate the good elements of one car in subsequent models, and that brake adjustments, shock absorbers, and paints are too impermanent. The answer of another driver suggested that a smaller engine, light strong construction, and a willingness to forego "gunshot acceleration" would produce a car capable of running from 30 to 40 miles on a gallon of gasoline.

Control, including responsiveness, starting, steering, and stopping, was the second topic of the "What's Wrong with Today's Automobile" questionnaire. The comments received indicated that many owners would welcome the return of manual control of spark and throttle on the steering column. Several drivers criticized the "superautomatic controls which cause consternation when they refuse to 'automat.'" Another deplored the tendency to build "mind-reading cars." He drew a distinction, however, between acceptable labor-saving devices and controls which leave nothing to the intelligent direction of the operator. "Driving some cars," said he, "is like playing a player piano."

Many engineers stressed the importance of steady, reliable power rather than quick acceleration. A number complained that the high gear ratio in most of the present steering systems, designed for ease in handling, eliminates the "feel of the road and the car" that aids in safe driving. "Steering the modern car reminds me of the old days when we cranked engines," wrote one driver. "Now the manufacturers are putting handles on steering wheels so we can crank the car around corners. The practice dangerously reduces the effectiveness of a vital driving operation." Optional steering gear ratios for men and women were suggested.

High-speed highways and traffic congestion demand improved brakes, greater braking surface, and brakes that do not require frequent delicate adjustments, in the opinion of many of the owners polled. Drivers also ask for an emergency brake which, in case of need, may be safely used as a service brake. Some emergency or parking brakes, especially the type which act on a drum on the propeller shaft, may be dangerous to use if the car is in motion. Dealers seldom warn purchasers of the disastrous possibilities of using such brakes except for parking. Excessive torque amplification, which adds to the difficulty of controlling cars on icy highways, was a criticism of service brakes.

Tires as an important factor of control were commented upon by several drivers who believe that one of the greatest needs is more research, with the object of producing, at a reasonable price, a tire which will eliminate so far as possible the very real hazard of blowouts. Shifting the engine forward, it was pointed out by others, has impaired safety by lowering traction and increasing the danger of skidding. Almost everyone criticized the inaccessibility of wheels under canopied fenders, which makes tire changing difficult and dangerous and the application of chains a profane, if not impossible, task. Wheels slotted for chain straps were advocated. For another advance in control one driver wrote: "Wanted: a car with a continuous-drive ratio automatically controlled for optimum engine speed for all

car speeds and loads, thus approaching the smoothness and vigor of the steam automobiles of 20 years ago."

The constant shifting of the right foot from brake pedal to accelerator is awkward and potentially dangerous, said a driver interested in simplification of control. An electrical engineer could not understand why most of the important wiring of a car is stuffed in an inaccessible maze behind the instrument panel. He ventured the thought that a junction box under the hood where it could be easily reached would be appreciated by owners and service stations alike.

IN DISCUSSING safety the answers were united in specific criticism of four driving hazards: glaring headlights, the difficulty of changing tires and applying emergency chains, sloping or V-shaped, divided windshields, and heavy corner posts that dangerously obstruct the driver's vision. Several engineers hoped that the day is not far distant when some form of polarizing material will make it possible to increase the power of headlights and at the same time eliminate headlight glare, which was cited as the outstanding danger of driving at night. "The average operator outdrives his lights," observed one owner, who digressed from his consideration of the shortcomings of cars to remark that the multiplicity of red and green advertising signs makes it difficult to identify traffic lights on business streets at night. Sloping windshields were branded as dust, rain, ice, and snow collectors. Furthermore, when driving into the sun they permit the head of the sun to fall into the driver's lap. V windshields, divided in the middle, obstruct vision and are confusing, because they force the eyes to focus through glass at varying angles, thus greatly increasing driving fatigue.

Other improvements advocated in the interest of safety were: a signaling device to show the intentions of the driver; bumpers on all four sides; drop jacks attached to the car to make tire changing easy and safe; more steel construction and rounded interior hardware to reduce crash hazards; placing the engine in the rear of the car to permit a smaller hood and increased visibility (surprisingly few suggested this, and one engineer decried it); doors that can be locked against opening by children; roof construction that will allow windows to be opened in the rain without drenching the occupants; adjustable visor over windshields to reduce sky glare.

Several engineers were of the opinion that striving for comfortable riding qualities has led manufacturers to lighten springs, placing too much dependence for their control on shock absorbers, which too soon get tired of absorbing resiliency. Headroom came in for a good deal of criticism, the general opinion being that the present low-roofed cars are inconvenient to enter, hot in summer, and difficult to ventilate. Elaborating on the problem of ventilation, which they deemed worthy of special attention, several writers criticized the systems now used. Some systems cause a slight vacuum which, some contend, may draw dangerous engine fumes into the car through floor boards and pedal apertures. Ventilation by a pressure system rather than by split windows and deflectors was frequently suggested. Engine fumes from the breather pipe should be disposed of at the rear of the car. *(Continued on page 90)*

Yardsticks for Infinity

"Nearly Everything Is About the Same Everywhere"

BY PHILIP M. MORSE

IN the past 20 years astronomers and astrophysicists have learned more about a larger portion of the universe than they had in the previous hundred years. They have amassed a huge amount of data concerning the various stars, nebulae, dust clouds, and other objects which litter the heavens. A great variety of methods of measurement has been used: some geometrical, some statistical, some physical, and some using other astronomical data not yet fully understood. The wildest approximations have been made, and nearly every method leans heavily on the astronomer's favorite axiom that nearly everything is about the same everywhere—more or less. Surprisingly enough, all the results seem to check and reinforce each other, forming an impressive and fairly coherent picture.

The methods of measuring stellar distances are an interesting example of how one shaky measurement can be stacked against another until there is enough overlapping and cross bracing to form a fairly solid structure. Of course even the combined results are probably uncertain by a factor of at least 20%; but this degree of accuracy is quite sufficient to show the main outlines of stellar distribution, and the need for greater accuracy can hardly be considered vital.

The start was made with good old-fashioned triangulation measurements of fair reliability: measurements of stellar parallax. The method is an extension of a way everyone uses to estimate distance and is the basis of stereoscopic vision. When one moves one's head to and fro, near-by objects appear to move relative to distant ones; the nearer the object, the greater the motion; the greater the distance the head is moved, the greater the motion and the farther can distances be measured. Astronomers, of course, do not wave their telescopes to and fro; they let the rotation of the earth about the sun do the moving, a far easier method and far greater motion than any other they could devise. Most stars drift

HOW RECENT MEASUREMENTS OF THE HEAVENS SHOW A WIDESPREAD UNIFORMITY AND LACK OF ORIGINALITY IN THE UNIVERSE—SAVE FOR THE UN-EXPLAINED RED SHIFT

slowly across the heavens, but superimposed on this steady drift is a minute yearly jiggle, the reflection of the earth's motion in the heavens. The magnitude of this oscillation, measured as an angle, is called the star's parallax, and is a measure of the closeness of the star.

A star with a parallax of one second of arc is about twenty trillion miles away, or about three and a quarter light-years away. The sun is about eight light-minutes away, the nearest star about four light-years away, the nearest nebula about 85,000 light-years away, and the faintest nebulae so far recognized are about five hundred million light-years away. Even though parallaxes as small as one-hundredth of a second can be measured (a second is the angle subtended by a dime three miles away, and a parallax of 0.01 seconds corresponds to a distance of 325 light-years), only a few thousand stars have been found close enough to have measurable parallaxes. Nevertheless, these few thousand stars must serve as a base line for all wider surveys. All other methods are statistical ones, based on the axiom of the uniformity of the universe and calibrated by comparison with parallactic measurement.

To make the next step, the steady drift of the star across the sky is used. This drift is called the star's proper motion and is measured in seconds of arc per century. The proper motion is a measure of the relative motion of sun and star or, rather, of that part of the motion perpendicular to the line of sight. It cannot be used directly to find the distance of an individual star, since the stellar drift is a combination of the sun's motion and that of the star, which is unknown. These motions are both steady ones, and so cannot be separated unless we know the star's distance. Nevertheless one can be sure that, on the average, the larger a star's proper motion, the nearer it is. Thus it is possible to devise a statistical gauge, giving the



Harvard Observatory, South African Station

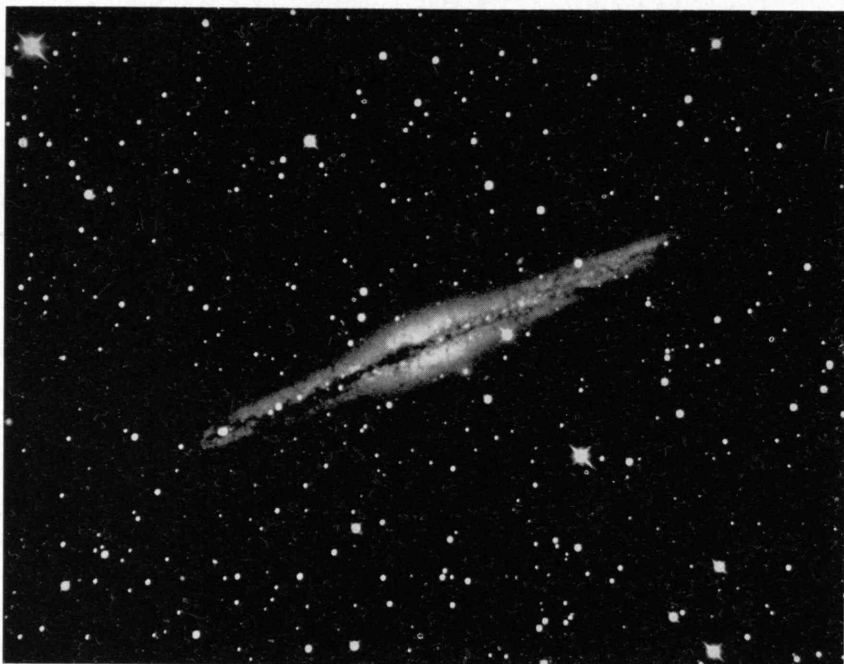
TEN MILLION

... light-years away. Group of nebulae in constellation Coma Virgo. The nebulae are distinguished from the stars by their smudgy image

average distance of a star having a given proper motion, which can be checked and calibrated by using stars of known parallax. This method extends the range of measurement from about three hundred light-years to about ten thousand light-years.

One such statistical law by itself is rather unsatisfactory; it needs to be reinforced by other independent measurements, even though they also are statistical ones. These needed reinforcements have come by the use of stellar spectroscopy. In the first place, a qualitative study of stellar spectra has confirmed the astronomer's belief in the lack of originality of the cosmos, for it shows that stars are surprisingly alike in the sort of light they send out. Instead of having a large variety of different spectra, representing all sorts of different proportions of chemical elements, it turns out that all stars can be arranged in a linear sequence of spectral types, with a more or less continuous distribution of specimens from one end of the line to the other. (Actually there are minor anomalies at the two ends of the line, but the majority of the stars fall along the line.) There are ten distinguishable types, which divide the line up into segments, labeled O, B, A, F, G, K, M, R, N and S — don't ask me why!

This simple result seems to indicate some relationship between spectral type and other properties of the star — its size, perhaps. As a matter of fact, there is such a relation: From a star's spectrum it is possible



Mount Wilson

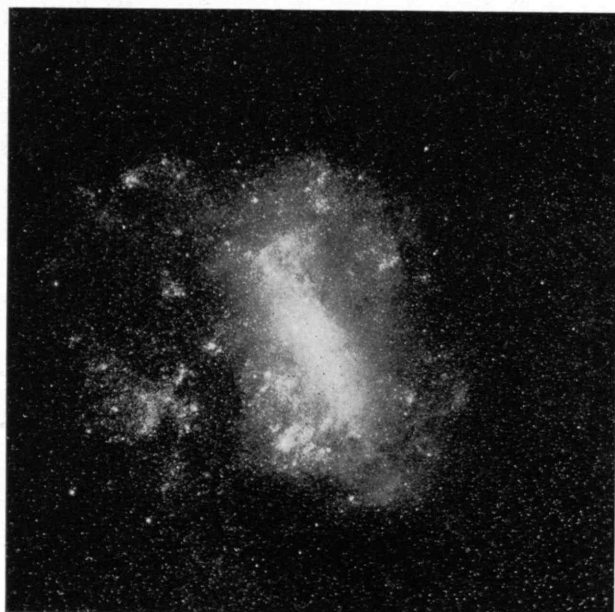
SIDE VIEW

A spiral nebula viewed from the side, showing obscuration due to central disk of dust

to guess its probable intrinsic or absolute brightness. (Absolute brightness is proportional to the total light emitted by a star and equals the apparent brightness it would have if it were 33 light-years away.) This relation has been checked and calibrated by using stars of known parallax, and can therefore be used as another statistical law to find distances: If the apparent brightness of a star is measured and its absolute brightness is known, its probable distance can be calculated.

Astronomers have also used spectroscopy quantitatively, to measure the velocity of a star toward or away from the sun. Just as a train whistle appears to have a higher frequency when it approaches than when it leaves, so the hydrogen spectrum (for instance) from an approaching star has a higher frequency than one from a receding star. The change in frequency can be measured and yields the velocity of approach or recession, which is called the star's radial velocity. It supplements the data on proper motion, which give the part of the star's relative motion perpendicular to the line of sight. There is, however, this important difference: Whereas proper motions are measured as angles, which can be translated into actual velocities only when the star's distance is known, the radial velocities are given directly as actual velocities. By making a statistical correlation between sizes of proper motions and sizes of radial velocities, another statistical distance gauge has been devised, which can also be checked and calibrated against stars with known parallax.

All these statistical methods, and a few others, have been correlated and cross-checked to study the average distribution of stars in our immediate neighborhood, astronomically speaking. The correlation was difficult until it was discovered that stars in certain directions are obscured by intervening clouds of dust, which make them seem, according to some methods, farther



Harvard Observatory, South African Station

NINETY THOUSAND LIGHT-YEARS AWAY

The larger Magellanic Cloud, the nearest extragalactic object, a small, irregular nebula, only 10,000 light-years in diameter



Harvard Observatory, South African Station

FRONT VIEW

... showing spiral shape, local clusters in arms, and central nucleus. This nebula is too far away to distinguish individual stars in it

away than they actually are. These troubles have been more or less surmounted now, and the correlated results tell us that the solar system is inside a huge, disk-shaped swarm of stars, most of them brighter than the sun. The disk is 5,000 light-years thick and 100,000 light-years in diameter. The sun is in a local cloud of slightly increased star density, which is out near one edge of the disk, 35,000 light-years from its center. The disk is the Galaxy, of course; the Milky Way shows us how a disk looks when viewed from the inside.

Analyses of star motions show that the disk is slowly turning about its center, much as the planets wheel about the sun. Dynamical analysis of the motion indicates that the total mass of the Galaxy is about one hundred billion times that of the sun. The star density increases toward the center, and much of the mass is concentrated in a central nucleus of star density much greater than that near the sun. We cannot see the nucleus because it is obscured by great clouds of dust, of fairly large density (about three ounces of dust per thousand million cubic miles!) near the nucleus, and extending in a thin disk out to the edge of the Galaxy. It seems likely that the dust accounts for about half the mass of the Galaxy. Surrounding the disk, and occupying a spherical region one hundred thousand light-years in diameter, are nearly a hundred globular star clusters, each about five hundred light-years in diameter.

Perhaps an analogy will give a better picture of the relative distances. If the solar system were about the size of a helium atom, then the Galaxy would just about fit in the Institute's Great Court. It would be a blob of gas of extraordinarily low density, its effective pressure being only 10^{-20} of an atmosphere. Above the Great Court and below it, would be the hundred globular clusters, each about the size of a football and thousands of times more dense than the main galactic disk.

This structure of the Galaxy is remarkably like that of many extra-galactic objects, the so-called spiral nebulae; a fact which strengthens our belief in the essential correctness of the picture. Accordingly it is of immense interest to measure the distance of some nebulae, to see whether the Galaxy is the same size as a typical nebula or not.

But here the earlier methods fail, for the nearest nebulae are too far to show any proper motion or to measure stellar spectra. A few individual stars can be distinguished in the nearer nebulae, but they cannot be separated enough from the background to obtain detailed spectra. So a new distance gauge was devised, that of the Cepheid variables. A Cepheid variable is a pulsating star whose brightness fluctuates in a periodic manner. The change in brightness can be as much as threefold and the period can be as small as 12 hours or as long as a month or so. A study of these stars showed that their average

absolute brightness is a simple function of their period, the longer period variables being the brighter. Enough Cepheids are in our own Galaxy to calibrate this relationship and to show that the variables are among the brightest of stars. One with a period of a month would have about a thousand times the brightness of the sun, and there are many brighter. How a star of this size can suffer explosions (Continued on page 92)



Harvard Observatory, South African Station

NEXT DOOR NEIGHBOR

The Andromeda Nebula, sister to our own Galaxy, living only 700,000 light-years away. In it can be distinguished variable stars and globular clusters similar to those occurring in our own Galaxy. This Nebula, our Galaxy, the Magellanic Clouds, and a number of smaller brothers and sisters make up the local group of nebulae

Science and the College

Studies "Most Useful and Most Ornamental"

BY KARL T. COMPTON

THIS article, reviewing Benjamin Franklin's concepts of science and education, is drawn from an address delivered by President Compton at the sesqui-centennial celebration of Franklin and Marshall College last October. THE EDITOR

AN invitation to discuss some aspects of science, in its relation to the college program, would be an honorable responsibility under any auspices; it is particularly so when the auspices are a notable anniversary of a college of fine traditions and service, whose origin and name came from America's first great scientist, Benjamin Franklin. I represent a sister institution whose academic program of observation, experimentation, and practical invention follows closely the spirit exhibited by Franklin in his own scientific work. I am most happy, therefore, to bring to you of Franklin and Marshall College the congratulations of your colleagues in the Massachusetts Institute of Technology and our faith that you will continue these traditions and public services in a manner to deserve distinguished commendation in future bi-, tri-, and multicentennials.

No statement, to my way of thinking, could be more expressive of Benjamin Franklin's philosophy of education than that which is taken from the petition which originally requested the granting of a charter for the establishment of your college. This petition expressed "conviction of the necessity of diffusing knowledge through every part of the state, in order to preserve our present republican system of government, as well as to promote those improvements in the arts and sciences which alone render nations respectable, great and happy."

Just as a preacher commonly uses a text, either as an authority for something which he wants to say, or to suggest to his mind some line of thought that may be explored with profit to his hearers, so it occurred to me that I might discover among the numerous writings of Benjamin Franklin some suitable basis for my remarks. Explaining this to our librarian, I asked him to send me several good books on Franklin's life and writings. He sent me six large books which I read with fascination and profit, but in none of them could I find any explicit statement by Franklin on the social values of science or on the role of science in education.

This dearth of statements about science in education on the part of one who had such an absorbing and productive interest in science and who was so fond of giving advice and recipes on the subject of self-improvement, was a surprise to me. It is evident, however, that Franklin's interest in science was *in science* and not in talking or philosophizing about it. And here is a very important point: To Franklin, interest in science seemed so natural that he felt no need to argue it; its practical

use was so apparent that he did not have to defend it. He simply did his scientific work, and the results themselves were the most eloquent demonstration of its import.

If I, for example, had Franklin's philosophy in such matters and possessed his originality as a scientist, I might not have accepted President Schaeffer's invitation to speak today, but would have replied that my interest in some current laboratory experiments and their possible importance made it improper for me to accept. Yet, perhaps not; for Franklin was also a great believer in the social values of educational publicity through writings and discussions. He might have accepted the invitation for the pleasure of spreading his scientific knowledge and stimulating others to support science or engage in its pursuit.

The only clues which my reading gave me regarding Franklin's ideas about science in a school curriculum were of an indirect nature. For example, he did not approve of the teaching of Latin or Greek — not because he disapproved of them *per se* but because he believed the time could be spent to better educational advantage on other subjects. When, in 1743, he drafted a plan for establishing an academy in Philadelphia — later to become the University of Pennsylvania — he described "a house in a high and dry situation, not far from a river, having a garden, orchard, meadow and a field or two, a library and an equipment of scientific apparatus; the scholars are to live plainly and temperately, and to be frequently exercised in running, leaping, wrestling and swimming. As to their studies, it would be well if they were taught *everything* that is useful and *everything* that is ornamental. But art is long and their time is short. It is therefore proposed that they learn those things that are likely to be *most* useful and *most* ornamental, regard being had for the several professions for which they are intended."

At this time Franklin urged no one special feature of the curriculum except that it should give training in the use of the English language. But all through his connection with the academy, he struggled to prevent his "useful" studies from being stifled by the weight and prestige of the classical studies. In this connection he wrote: "There is in mankind an unaccountable prejudice in favor of ancient customs and habitudes, which inclines to a continuance of them after the circumstances which formerly made them useful cease to exist. A multitude of instances might be given, but it may suffice to mention one. Hats were once thought a useful part of dress; they kept the head warm and screened it from the violent impressions of the sun's rays, and from the rain, snow, hail, etc. Gradually, however, as the wearing of wigs and hair nicely dressed prevailed, the putting on of hats was disused by genteel people, lest the curious

arrangements of the curls and powdering should be disordered, and umbrellas began to supply their place; yet still our considering the hat as a part of the dress continues so far to prevail that a man of fashion is not thought dressed without having one, or something like one, about him, which he carries *chapeau bras*, which means under his arm. So that there are a multitude of the politer people in all the courts in capital cities of Europe who have never, nor their fathers before them, worn a hat otherwise than as a *chapeau bras*, though the utility of such a mode of wearing is by no means apparent, and is attended not only with some expense but with a degree of constant trouble. The still prevailing custom of having schools for teaching . . . our children in these days the Latin and Greek languages I consider therefore in no other light than as the *chapeau bras* of modern literature."

Franklin had no patience with the practice of sending children to college for social prestige rather than intellectual endeavor, and I suspect that he would, today, advocate rigid entrance requirements and at the same time would desire colleges of many types to educate different groups for the various objectives which have a proper place in our social order. In reference to high standards, Franklin deplored the tendency of "every Peasant, who had the wherewithal, to send one of his children to this famous Place (a college) in which, as most of them consulted their own purses instead of their Children's Capacities, I observed a great many, yea the most part of those who were travelling thither, were little better than Dunces and Blockheads. Many of them from henceforth for want of Patrimony, lived as poor as Church Mice, being unable to dig, ashamed to beg, and to live by their wits was impossible."

Thus we learn something of Franklin's educational philosophy: He included science among the studies "most useful and most ornamental"; from the history of the founding of Franklin College, it is evident that he put science alongside of citizenship, socially, as the most important objectives of the college training; he emphasized the importance of acquiring ability to use the English language effectively; he felt that the dead languages were relatively overemphasized in the schools of his day; and he deplored the wasting of educational facilities upon students of inferior quality.

While we learn little about Franklin's ideas of science in education from his writings, we learn a great deal from his actions. He had a burning curiosity to know the facts and explanations of his environment. He was never so happy as when studying or experimenting on scientific questions. He had an irrepressible urge to turn his scientific knowledge to practical account through inventions. He was so impressed with the social values of these inventions that he refused to accept any financial reward from them, but donated them freely to the public. Franklin's interest in science was, therefore, very direct and very practical.

Perhaps the most comprehensive statement which he made to indicate his range of interests in science and his faith in its practical value to mankind is found in his plan of 1743 for founding the American Philosophical Society. As you read the following quotation from his prospectus of this Society, I would ask you to note that

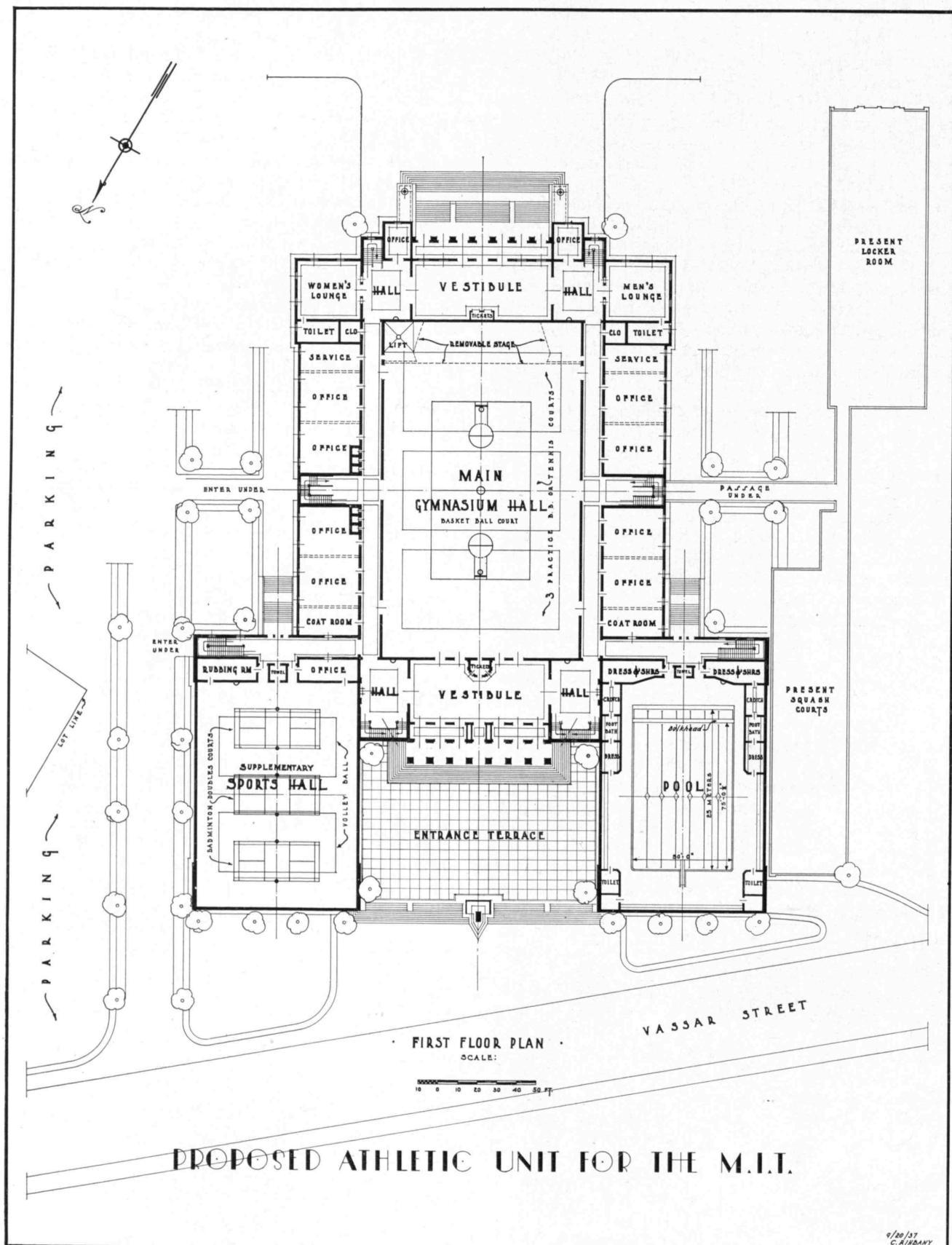
today, nearly 200 years later, the same subjects are matters of intense interest in science, industry, and agriculture. He specified "that the subjects of correspondence be: all new discovered plants, herbs, trees, roots, their virtues, uses, etc.; methods of propagating them, and making such as are useful, but particular to some plantations, more general; improvements of vegetable juices, as ciders, wines, etc.; new methods of curing and preventing diseases; all new-discovered fossils in different countries, as mines, minerals and quarries; new and useful improvements in any branch of mathematics; new discoveries in chemistry, such as improvements in distillation, brewing and assaying of ores; new mechanical inventions for saving labour, as mills and carriages, and for raising and conveying of water, draining of meadows, etc.; all new arts in trades and manufactures . . . and all philosophical experiments that let light into the nature of things, tend to increase the power of man over matter and multiply the conveniences or pleasures of life."

Not only is this outline of the scope of science as applicable today as it was when Franklin wrote it, but the field appears to be inexhaustible. As he himself said: "The world is daily increasing in experimental knowledge, and let no man flatter the age with pretending that we have arrived at a perfection of our discoveries."

With this perspective of the scope and practical value of science, expressed in Franklin's own words, let us examine the more particular subject of my address, "Science and the College." I would suggest four educational values of science which, severally and together, justify science as a part of any college curriculum and point the objectives toward which the educational processes should be directed.

First in importance I should put advancement of knowledge. This involves research in the higher stages of education and study in all stages of education. But to extol knowledge without exercising critical judgment as to the relative values of different kinds of knowledge is folly; for, while we admit that all knowledge is desirable, as contrasted with ignorance, yet some categories of knowledge are so much less significant than others, that their pursuit may be the height of foolishness. To know, for example, the number of times in which each letter of the alphabet occurs in the King James version of the Bible is, except perhaps for a printer, of far less significance than to know the problems confronting our legislatures or the basic principles of electricity. While Franklin did not limit his interest in science to what was immediately useful, it is evident that he had a profound conviction that accurate knowledge of nature and of man, based on observation and experimentation, stood very high in the scale of relative values of knowledge.

Scientific knowledge has had enormous influence on man's cultural and spiritual development—in his attitude toward his relation to his environment. It has replaced ignorant superstition, in which men could be swayed by fears, with that security and confidence that arise from understanding. "The truth shall make you free." Even in Franklin's time superstitions were rife. When he invented the lightning rod for protection against the dangers of lightning, (*Continued on page 95*)

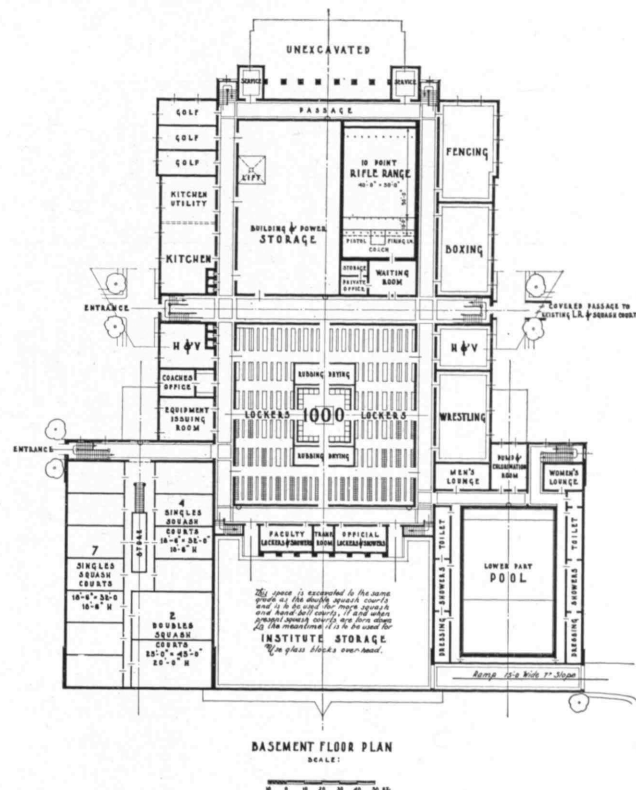
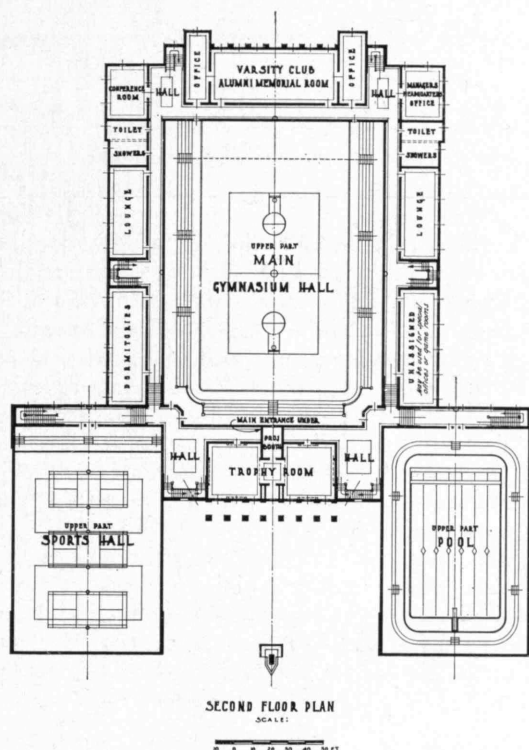


9/20/37
C. ALBANY

IF YOU HAVEN'T SEEN THEM, HERE ARE THE PLANS

... on this and the opposite page, for Technology's Student Recreational Center. This unit not only will provide adequately for sports but will be used as an auditorium for large meetings, graduation exercises, and student convocations (seating capacity: 3,000), and as a dining hall (seating capacity: 1,300).

The Alumni Fund Drive now under way seeks to raise \$1,650,000 to cover the cost of this unit and, in addition, a field house and cage, and much-needed alterations in Walker Memorial



Why Should I Give?

An Open Letter to Technology Alumni

THE following letter was originally written to Technology Alumni in Vermont. The Review reprints it because it is one of the most admirable statements we have seen of the reasons why Alumni are contributing so generously to the Alumni Fund for providing better recreational facilities for Technology students. THE EDITOR

TO TECHNOLOGY ALUMNI:

As a member of the General Advisory Committee of the Alumni Association of the M.I.T., assigned to Vermont, I address this letter to you. You have received full information concerning the needs of the Institute and the plans of proposed buildings designed for student welfare. We Alumni have been asked to contribute to a fund that is being raised to carry out these plans.

I have asked myself these questions: What has Technology done for me? To what extent am I indebted to Technology? Why should I make a contribution?

I was graduated with the Class of 1886 and have lived to enjoy the benefits of my education, whatever they may be. I am convinced that the cultural, scientific, and technical training that I received in the four years spent at the Institute has been the source of much pleasure and contentment throughout my entire life, to say nothing of any advantage it may have given me in gaining a livelihood. For 50 years since I was graduated I have taken the greatest pleasure in watching the rapid development in science and engineering. My education gave me a taste for scientific reading which I could not have cultivated without it. This has been a source of

contentment in many hours which might otherwise have been less pleasantly spent. The systematic scientific method of approach, which a technical education inculcates, I have found useful in attempting the solution of problems not always of a technical character, and I hope has made me a more useful citizen.

When I contemplate these advantages which I have enjoyed through life as the result of my training at the Institute, I have a feeling of gratitude to that institution and those who helped me to study there. Furthermore, it gives me a desire to help others to secure similar benefits. It gives me a desire to see that great institution develop and maintain its position on the firing line in the attack that is being made upon the mysteries of this universe in which we find ourselves and of which we know so little, and upon the problems of our social life. Thus I answer the questions, what has the Institute done for me? and to what extent am I indebted to it?

The tuition I paid probably did not cover more than one half the cost of my education. Here is an opportunity to show my appreciation. There are other reasons for contributing: the satisfaction of helping others; of helping to further the cause of science and technology. For these reasons I must be a contributor to this Technology Fund. But to make it a full success, every Alumnus should contribute something in proportion to his ability. — Pardon me for saying so much about myself. I have done it to touch, if possible, a sympathetic chord. . . .

BIRNEY C. BATCHELLER, '86.

Wallingford, Vt.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

New Graduate House

THE urgent need for additional dormitory space at the Institute will be met to a large degree by the purchase of Riverbank Court Hotel, long a familiar landmark to students, for use as a Graduate House. One of the most desirable apartment hotels of Greater Boston, the building stands at the corner of Massachusetts Avenue and Memorial Drive, directly across the street from the Institute's main building. In announcing the purchase on November 12, Treasurer Horace S. Ford said that the building, which contains 140 suites, complete dining service, and several large public rooms, will accommodate 350 graduate students.

The facilities of the new house, provided by this investment of Institute funds on the basis of expected net income from dormitory operations, will greatly enhance opportunities for social contacts and cultural development among a large group of men of widely differing professional interests but of equivalent intellectual outlook. The new unit will be administered under the direction of Avery A. Ashdown, '24, faculty master of the present Graduate House, and a committee of students. More than 180 colleges and some 50 foreign educational institutions are represented among the Institute's 661 graduate students.

Commenting on plans for student housing, President Compton said that purchase of Riverbank Court Hotel for the use of graduate students will release the present Graduate House, which includes Ware, Atkinson,

Crafts, Runkle, Holman, and Nichols dormitory units, for the accommodation of more than 200 undergraduates. Plans are now under consideration, he revealed, to utilize this group of dormitories as a house for seniors. If this plan is decided upon, the house would be operated on the same congenial plan of student administration now in effect in the Graduate House. The new addition to Technology's dormitory group will give the Institute facilities for 620 undergraduates, or approximately 20% of its student body, in addition to the new quarters for 350 graduate students.

Riverbank Court was built in 1900 and its proximity to the Institute adds greatly to its value as a Graduate House. In order that its present tenants may have ample time to make plans for the change, the Institute will not make use of the building until next autumn.

Registration

THE Institute's registration this year reached a total of 2,966, an increase of 173 students over last year, Registrar Joseph C. MacKinnon, '13, reported on November 1. Graduate enrollment, with a total of 661, was up 42 students, while the freshman class of 605 was smaller by 45 students. The decrease was due to provisions for stabilization of enrollment, under which the number of entering students is held to approximately 600.

A study of registration this year shows a wider geographical distribution than in the past. In 1936-1937 slightly more than 50% of the freshman class came from

PURCHASED BY THE INSTITUTE

*Riverbank Court Hotel,
across Massachusetts
Avenue from the Institute,
has been bought for use
as a dormitory for graduate
students (see above)*



outside New England, and this year the proportion is slightly more than 60%. Three years ago only ten students came from states west of the Rocky Mountains, while this year there are 19. There are now at the Institute approximately 90 first-year students from Texas and the Rocky Mountain States. Students from foreign countries this year number 214, an increase of 41 over last year. They come from 38 countries, and among them are 96 graduate students and 29 freshmen.

Chemical engineering now leads in registration with a total of 473 students, a gain of 21 over last year. Next in line is electrical engineering which, with its various options, has a total of 452 students, eight more than last year. Mechanical engineering, up 59, has an enrollment of 382. Business and engineering administration has 269, a decrease of five from last year. Next comes aeronautical engineering which, with a total of 210, is down 11. Chemistry, gaining 10 in this year's registration, has a total of 186 students, while civil engineering, including building engineering and construction, is up nine, with a total of 165. Physics gained three students, making a total of 137, and architecture, including its options, was up seven, with a total of 116 students.

Intercollegiate Regatta

COMPETING against the best racing skippers from 18 eastern colleges in the largest intercollegiate dinghy regatta ever held, Technology's crews won the coveted Boston Dinghy Club's Intercollegiate Challenge Cup on the Charles River Basin on November 7. The regatta drew international competition for the first time when McGill University of Montreal sent two crews.

Technology's crews, with Runyon Colie, Jr., '40, the leading intercollegiate dinghy skipper, and Herman H. Hanson, '39, at the tillers, and Charles E. Olsen, Jr., '38, and D. B. Downer, Jr., '40, as crews, scored 89 points. Brown University, defending the cup, was second with 73 points, while Cornell took third place with 72. Harvard finished fourth, with a score of 67½ points; Tufts had 64½; Trinity, 59; McGill, 51; Haverford, 40; and Princeton, 36. Other colleges competing were Yale, Dartmouth, University of Pennsylvania, Boston College, Northeastern University, Holy Cross College, Rhode Island State College, Georgetown University, Worcester Polytechnic Institute, and Amherst College.

Technology's entire fleet of 40 boats was on the river throughout the day, during which the final challenge cup contenders were chosen by elimination races sailed in a stiff westerly breeze that softened by the time the challenge series was started in the afternoon.

An interesting feature of the regatta was the formal presentation of the Henry Adams Morss Memorial Cup to the Intercollegiate Yacht Racing Association, which in turn awarded the trophy to M.I.T. for its victory in the Intercollegiate Regatta last spring. The new trophy was established by friends of the late Mr. Morss, '93, long a member of the M.I.T. Corporation, and one of the Technology committee which decided upon the design of the Institute's sailing dinghies. Presentation of the cup was made by Charles Francis Adams, former Secretary of the Navy and a noted New England yachtsman. Mr. Adams was introduced by President Compton, who



Boltear

JOHN E. BURCHARD, '23

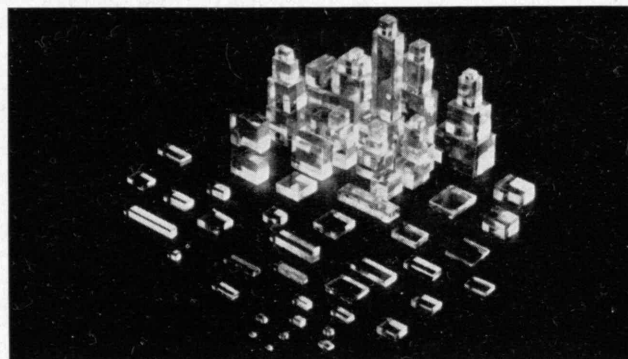
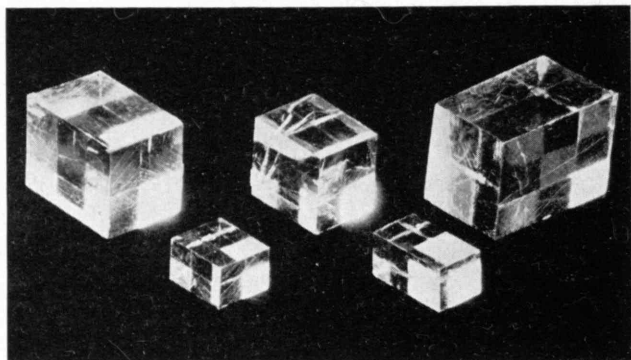
... who has accepted the vice-chairmanship of the Alumni Fund Committee. Mr. Burchard, who is vice-president of Bemis Industries, Inc., a widely known engineer, and one of *The Review's* ace contributors (see page 71), joins with Chairman Thomas C. Desmond, '09, and Director Elbert G. Allen, '00, in the management and coördination of this great campaign, alumni-initiated and alumni-conducted, to provide better recreational facilities for Institute students. The addition of Mr. Burchard to the central committee comes as the campaign shifts into high gear in its race toward the goal of \$1,650,000

spoke of the remarkable interest in sailing at M.I.T., where nearly 500 students are members of the Nautical Association. The cup was accepted for M.I.T. by Commodore John C. Proctor, '38, who also was presented with the challenge cup of the Boston Dinghy Club.

Students and Religion

THOSE who are disturbed by reports that the American college student is losing interest in religion will find reassuring evidence to the contrary in a religious census of Institute students, just completed by the Technology Christian Association. This survey, based on information gathered from registration material submitted by students, shows that of a total of 2,929 students, 2,511 are affiliated with, or have expressed an interest in, some specific religion. Only 418 left unanswered the question on religious affiliation.

Interest in religion among students this year shows an increase over 1936, when 2,302 of a total of 2,781 students expressed an interest in, or affiliation with, a religion. Thus 479, or 17.2%, gave no indication of such an interest, as compared with only 418, or 14.3%, this year. In 1930, when registration stood at 3,209, there



NEW EYES FOR OPTICAL INSTRUMENTS

The need for optical materials which will transmit light beyond the range of the best optical glass or even of natural quartz has been met in recent years by the artificial growth of crystals having the desired optical properties. In 1935, Donald C. Stockbarger, '19, of the Institute's Department of Physics succeeded in placing on a production basis the synthesizing of lithium fluoride crystals, which transmit light from high in the infrared region of the spectrum through the visible band and deeper into the ultraviolet zone than any known optical substance. Advancing his technique, Dr. Stockbarger is now able systematically to grow crystals of potassium bromide. These crystals, which are extremely rare, are useful for studies in the high infrared region of the spectrum.

Above at the left are five potassium bromide crystals in which the effects of refraction and reflection produce an interesting checkerboard pattern. They are, as a matter of fact, clear, whole crystals. The gleaming skyscrapers of what appears to be a Lilliputian city at the right are made up of parts of a large crystal. The cubic forms represent the natural lines of cleavage as they were separated from the parent crystal

were 2,600 students who gave religious affiliations or preferences, and 609 who did not answer. Fourteen years ago, when the registration was 2,950, there were 2,478 students who gave religious affiliations, and 472 who made no statement on the subject.

Wavelengths of the Elements

THE election of George R. Harrison, director of the Research Laboratory of Experimental Physics, to membership on the commission on wavelength standards of the International Astronomical Union, suggests a report on the significant wavelength-measurement project now in progress at the Institute.

Since the first announcement of this enormous task, in October, 1935, Dr. Harrison's staff has made some six million measurements of the wavelengths of about 70 of the chemical elements. These measurements are accurate to one part in three million, or about one hundred times as accurate as those presented in the first catalogues of spectrum lines assembled 40 years ago. The results of this continuing project will be reported by Dr. Harrison at the meeting of the International Astronomical Union in Sweden next summer. These measurements have been made largely by unskilled people using new automatic computing and measuring devices developed at the Institute. A group of W.P.A. clerical workers, operating under the immediate supervision of Robert C. Eddy, have carried on this paradox of modern scientific research with graduate students in spectroscopy acting as supervisors. Application of machinery to research — or of the production system to physics, if you will — has thus made it possible for untrained individuals, aided by a few with special training, to do quickly and accurately what has hitherto been done slowly, by hand methods, only by highly trained investigators.

It is hoped that by the end of another year it will be possible to issue a new catalogue of spectrum lines carrying the results of the project. Catalogues of this kind are useful in all scientific fields but especially so to physicists

in the study of the atom, to astronomers in the study of the stars, to chemists in the analysis of materials, to biologists, and to metallurgists. It is anticipated that the Technology catalogue may present the spectrum lines of all the chemical elements on a unified basis.

Three years ago, Professor Harrison and Walter E. Albertson, '33, research associate in physics, were trying to unravel the structure of some of the rare-earth atoms, and were held up by the fact that wavelength data available then were insufficient. The making of a new set of measurements was therefore undertaken. On the results obtained thus far in the M.I.T.-W.P.A. program, Albertson and Harrison have, however, within the last month, succeeded in breaking open the spectrum of cerium.

The wavelength program which grew out of the cerium difficulty has thus already given one successful result in starting analysis of the cerium spectrum, and that analysis has provided a check on the accuracy of the results obtained from the program. The value of the high-speed computing machines (see picture on opposite page) devised for the purposes of the program has also been demonstrated.

The interest in the work and the diligence shown by the W.P.A. group have contributed in no small measure to the extent and accuracy of the results attained.

Visiting Committee Report

DEPARTMENTAL visiting committees are appointed by the Corporation and in general are composed of two members nominated by the Alumni Council, three from the membership of the Corporation itself, and two selected at large. Twenty-two of these committees, with a combined membership of 154, are now actively serving the Institute by placing at the disposal of the departments their wide experience, their objective judgment of the departments' work and plans, and their strong support in helping the departments to gain approved objectives.

The reports of these committees are published in condensed form from time to time in these pages and provide not only interesting comment on the Institute's educational work but convincing evidence as well of the help which these committees are rendering.

This month we present a report on the Department of Modern Languages.

DEPARTMENT OF MODERN LANGUAGES*

IT was brought to the attention of the Committee that the entrance requirements have been liberalized to the extent of admitting to the Institute students who have had no preparation in any foreign language. . . . It was suggested to the Committee that the idea be disseminated among those proposing to come to the Institute that, even though the acquisition of a foreign language is not a requisite for entrance, it will be a requisite before graduation, and that students will be measurably advanced in their studies if they devote themselves, before entrance, to the acquisition of at least an elementary knowledge of some foreign language.

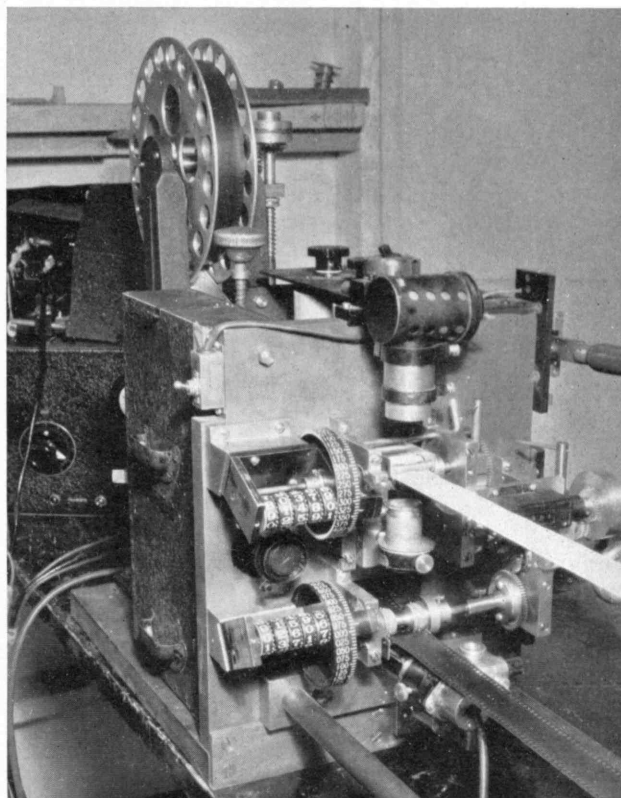
In its report to the Corporation last year, this Committee urged the importance to the student of an oral and working knowledge of at least one foreign language, and the Committee deprecated a course of study that leaves the student with only the bare power to translate the foreign language into English. The Committee urges that the curriculum be developed with the object of giving students a working mastery of the languages they have elected to study, so that they can not only get at the meaning of the written word but can also acquire the ability to speak some one foreign language easily, fluently, and correctly.

It is a well-known fact that modern foreign languages usually receive little favorable support from students pursuing engineering courses or other courses relating to science, except where the current literature of the field is so predominantly in a foreign language that students recognize the necessity for a reading acquaintance with that language as a strictly professional factor in their education. The situation at M.I.T. with respect to the modern foreign languages has not differed essentially from this situation usual in engineering schools. The statistics showing established budget expenditures and the proportion of students who have been enrolled, year by year, in foreign language subjects at M.I.T. merely corroborate the fact that at the Institute the situation has been substantially similar to that in other engineering schools.

The broad question before this Committee is whether the Institute should continue in the conventional situation, or, escaping the conventional, should assume a changed attitude toward this work and endeavor to put it on a level corresponding to that of English, economics, and certain other humanistic subjects in the respect and affection of the students. It is reasonable to express the opinion that the latter can be achieved. Even if the entire end be not achieved, it may be said that an effort to achieve is worth the launching.

* Members of this Committee for 1936-1937 were: W. Cameron Forbes, Chairman, James M. Barker, '07, John E. Aldred, William R. Hedge, '96, Donald W. Kitchen, '19, Arthur T. Hopkins, '97, Dugald C. Jackson, Faculty Emeritus, and Christian Gauss.

Consideration of the situation suggests that there is a marked distinction between the status of the Department of Modern Languages at M.I.T. and similar departments in many universities and liberal arts colleges throughout the land, where the subjects of French, German, Italian, and Spanish stand out in considerable strength. In the latter institutions the departments dealing with these languages have a problem of professional character relating to the education of young men and young women, many of whom may wish to become teachers of the languages or their literatures. This provides for the subjects a strong nucleus of definite professional interest which fertilizes widely among the students — a characteristic that is absent at the Institute since here the ambition of students to become language teachers is absent. This important difference, and other differences which it is not essential to describe, indicate that the probable solution of the difficulties at M.I.T. may be secured by taking an entirely new and original view of the situation.



WAVELENGTH MACHINERY

The spectrum interval recorder, a new machine developed under the direction of George R. Harrison in the Department of Physics to supplement two previous machines: the spectrum interval sorter and the automatic wavelength comparator, which have made possible six million measurements of the wavelengths of 70 of the chemical elements (see story opposite).

The comparator enables unskilled clerical workers to calculate spectral wavelengths to seven-figure accuracy, while the other machines help in the utilization of these data for investigation of the structures of atoms. The figured dials read the frequencies with which the atoms have broadcast the spectrum lines, and the machine records pairs of frequencies which have been shown by the interval sorter to be important in the analysis.

With the help of such machines, it is hoped by the end of another year to issue a new catalogue of spectrum lines

New York Alumni Dinner

At the request of Alfred T. Glassett, '20, President of The Technology Club of New York, The Review calls the attention of Alumni to the Technology dinner to be held in New York on Thursday, December 9, at the Hotel Astor.

Speakers will be President Compton, Gerard Swope, '95, President of the General Electric Company, Professor Warren K. Lewis, '05, and Senator Thomas C. Desmond, '09. Following these speakers, talking motion pictures will be shown.

"We all feel," writes Mr. Glassett, "that this unusually interesting program and unusually low price (\$2.50) should attract a record-breaking turnout of Technology men not only from this territory but from the surrounding districts."

The objectives of the foreign language work at M.I.T. may be stated as twofold: One is very specific, and it is to assure a competent reading knowledge of professional literature in specific lines by students who are following particular Courses, such as architecture or chemistry.

The other is much broader and relates to the general influence on the students' welfare of a mastery in the arts of expression. English, if its use is fully mastered, is the foremost factor in this need, and, when fortified with the ability of making and reading drawings, a student's powers in the arts of expression may be quite satisfactorily established through study of the English language.

It is the truth, however, that M.I.T. should place emphasis on such notable powers in the arts of expression as lead toward those recognized qualities found in outstanding men of influence in the engineering industries and the engineering profession. A man's engineering work is never complete until its results have been convincingly laid before others. The same is true of work in science. From this aspect, an acquaintance solely with English is not enough to give the sufficient language power that is desirable. The effect which intimacy with a second language exercises upon the flexibility, the vitality, and extent of vocabulary of English brings to the command of the user of English a needed widening of power. This is an objective in the study of the modern foreign language which is not always sufficiently stressed, and this Committee may justly emphasize it and urge its importance upon the administration and Faculty of the Institute.

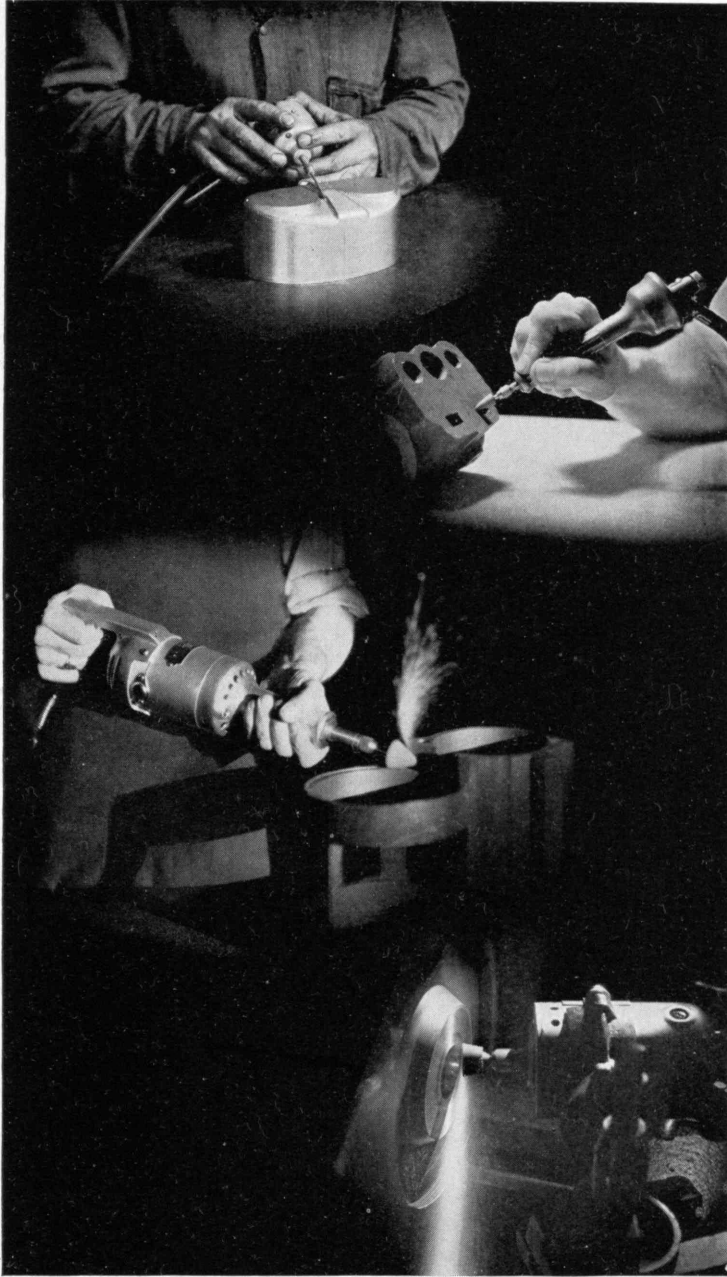
We must also consider more seriously than we have whether it is not true today that an engineer who possesses only one language is running serious risk of remaining parochial and limited in his outlook upon our larger modern world. It is suggested that there is a growing wish in some of the departments of the Institute, and perhaps generally among members of the Faculty, to secure for the students this important objective, which may be achieved by a student studying at least one modern language, in addition to English, after he arrives at the Institute. It is preferable that the student take advanced work in a language which he has studied prior to coming to the Institute and has offered as an entrance provision. The effort of the Modern Languages Department in this second objective should therefore be to vitalize the language instruction by

putting it securely upon a basis of value as a means of communicating ideas, in which aspect it becomes collateral to English.

The administrative problem requires careful consideration, especially since the foreign modern languages are shown by the statistics to be held very weakly in the interest and affection of Institute students. On the other hand, the arts of expression are now quite fully recognized by M.I.T. students as a very important thing for them to master in the course of their education, and this has come to reflect a great deal of interest in the study of English. As the major (second named) objective, stated above, is to secure, by the study of one or more foreign languages of a modern type, collateral strength for power in the arts of expression which usually rests on the English language and drawing, the Committee recognizes that the recent step taken by Technology in creating a position of dean of humanities, with Edwin S. Burdell, '20, as the dean, has been a move in the right direction. The coördination and interrelationship of the studies of history, of English, and of modern languages make it appropriate that they should be associated under the general direction of one dean, and the Committee is pleased to endorse heartily the action of the Institute in creating this new division.

The helpfulness of a course of travel in an appropriate foreign country in assisting students to acquire a working knowledge of its language and also to obtain a realizing sense of its cultural advantages was brought to the attention of the Committee. The Committee also has learned that the opportunity for a summer's travel in some appropriate foreign country may now be arranged through travel agencies that provide tourist or low-priced accommodations on steamers, and bicycles with which to make the trip. Extremely small sums of money, added to what the student can save from his own resources, will often make such trips possible and result in great cultural advantage to the student and improvement in his power of expression in the foreign language which, as indicated above, has a beneficial effect upon his power of expression in his native tongue. The Committee hopes that funds will be sought or allocated to make such trips possible each year to an increasing number of Technology students.

The influence of science and engineering upon the vernacular in the various languages, the influence of science and engineering on interrelated vocabulary in the various modern languages, and numerous other such scholarly fields are of great interest but have not been utilized much in the past. Such activities might arrest the attention and enlist the interest of the students more than the usual literary and research activities of language and literature teachers. It is a matter of note that the staff of the Department of Modern Languages may be productive of much independent, original, and scholarly material. It may be unqualifiedly asserted that such productive activities are important in order that the attention, interest, and confidence of the numerous desirable students of M.I.T. may be secured for the Department. Many of these students ought to be pursuing a career of study with appropriate emphasis on the modern foreign languages in order to increase their mastery of the powers of expression.



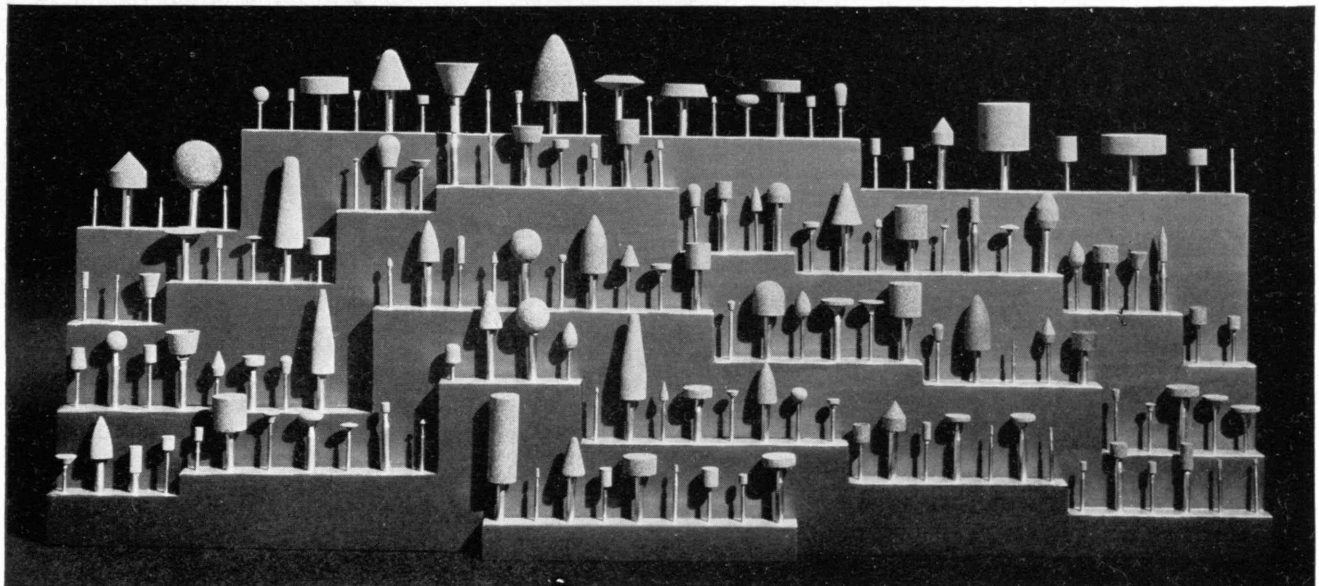
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YARDSTICKS FOR INFINITY

(Continued from page 79)

cataclysmic enough to treble its brightness, regularly once a week or oftener, and keep it up year after year without going to pieces, is a problem which must some day be answered by the theory of stellar constitution.

The Cepheids have enabled astronomers to make the leap from our own star swarm, the Galaxy, to the next nearer swarms. They have been used to determine the sizes and distances of the globular clusters belonging to our own Galaxy, and they have been distinguished in enough numbers in the nearer spiral nebulae to enable their distances to be measured. It is found that our Galaxy is part of a group consisting of the Spiral Nebula in Andromeda, about the same size as ours, with about the same structure, and about seven hundred thousand light-years away; together with about ten smaller nebulae, some irregular, some elliptic, and some spiral. On our small-scale model, using for our Galaxy a gas of helium atoms filling the Great Court, the Andromeda Nebula would be a similar blob across the river on Beacon Hill; the irregular Magellanic Clouds would be on the Aeronautics Building; and the other nebulae would have intermediate distances.

The next nearer nebulae, the group in Virgo, are much farther away, seven million light-years, corresponding on our small-scale model to a location somewhere in Newton. This large group, containing several hundred nebulae, is already too far away for us to be able to see individual Cepheids; in fact, only the three or four very brightest stars in each nebula can be distinguished as separate stars. It is noticed, however, that these bright stars all have about the same absolute brightness, and this fact is checked and calibrated in the nebulae in our own group, where the distances are known. It would seem that a star can be only just so bright, about fifty thousand times brighter than our sun, without becoming unstable. There are enough stars in the bigger nebulae for us to be sure that a few stars will be close to this limit. By measuring the apparent brightness of the brightest stars in a nebula, we can find its probable distance.

This statistical gauge of brightest stars extends our range of measurement out to ten million light-years, beyond which it is no longer possible to distinguish any star in a nebula. However, within this distance there are enough nebulae for us to see that each of the few structural types has its own typical over-all brightness. Thus it is possible to use nebular brightness as a statistical gauge of distance. It is almost our ultimate gauge, for when we can no longer distinguish a nebula from a star we cannot be expected to measure its distance. The method of nebular brightness extends our measurements to a distance of about five hundred million light-years, corresponding to the distance from Boston to Washington on our small-scale model — not bad for the little helium atom which is our solar system!

This huge range of space has, of course, not been explored to any extent, for it contains nearly as many nebulae as our Galaxy contains stars. The samples which have been studied show nothing very new or strange — just more nebulae, in *(Continued on page 94)*

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Paul Brown 37

INFORMATION ON M.I.T.

THE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

Ask for the following pamphlets by their descriptive numbers

1: For general information, admission requirements, subjects of instruction, ask for Bulletin 1.

2: For announcement of courses offered in Summer Session, ask for Bulletin 2.

3: For information on courses in Architecture, both Undergraduate and Graduate, ask for Bulletin 3.

4: For a popular presentation of Educational Opportunities offered at M.I.T., ask for Bulletin 4.

All inquiries sent to the address below will receive prompt attention

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YARDSTICKS FOR INFINITY

(Continued from page 92)

bunches, pairs, and by themselves. But the study has yielded data which seem to provide both a new and powerful distance gauge and an interesting proof of the axiom of universal uniformity, on which the sequence of distance extrapolations is based.

When the apparent radial velocities of nebulae are measured, all but our local group seem to be receding from us, the more distant ones going faster. Actually, no velocity is measured; what is observed is that the light from distant nebulae is redder than that from near-by ones, and this is interpreted as a velocity of recession. An analysis of the data shows that the apparent velocity of recession is proportional to the distance, a hundred miles per second for each million light-years of distance. This is the famous red shift, which many have taken to prove that the universe is continuously expanding. However that may be, the red shift can be used as a distance gauge, and has served to check and reinforce our other methods of measuring nebular distances. It works best for huge distances, where the uniform recession is much greater than the individual, random velocities of the nebulae. It would be used for most nebular distance determinations were it not that photographing the spectrum of a faint nebula is an excessively difficult job.

Data on distant nebulae show further that when allowance has been made for the obscuration due to our Galaxy's dust cloud, their density is practically uniform in all directions. When an analysis of nebular distribution in space is made, a little ambiguity arises, however, for the results depend on our interpretation of the red shift. When the red shift is interpreted as an actual velocity due to the expansion of the universe, the correction which must be applied results in a nebular density which *increases* with increasing distance from our Galaxy. On the other hand, if the universe is not supposed to be expanding, and the red shift is attributed to some other cause as yet unknown, then the correction is just enough to make the nebular density be uniform everywhere, out to the greatest distance yet fathomed.

This uncertainty in interpretation is rather annoying. We have become inured to the idea of an expanding universe (or, rather, some scientists have), but it is rather disconcerting to find more nebulae everywhere else but here. On the whole, a nonexpanding universe uniformly filled with nebulae, all more or less alike, is a rather more satisfactory picture, even though it sounds a bit monotonous. Unfortunately this leaves us with an unexplained red shift. Relative recessions have been ruled out, and any clouds of dust or gas would scatter or absorb the light before they turned it red. However, many things could happen to light, as it speeds along for millions of years, which could not be detected by puny terrestrial measurements. Also, though this is not likely, the discrepancy may be experimental error, and our universe may be a uniform one which is expanding. After all, the present results depend on measurements which stretch the hundred-inch Mount

Wilson equipment to its utmost. Perhaps the new two hundred-inch telescope can reach enough farther out in space to settle the matter for us.

Aside from this minor discrepancy, however, recent measurements exhibit a widespread uniformity and lack of originality in the universe, tending to confirm the astronomer's favorite axiom and the methods of measuring distance based on it. At first sight these methods sound about as useful and as efficacious as that of lifting oneself by one's bootstraps. A more correct analogy would be that of climbing up a silken rope. No single fiber would support the load, and no single fiber runs the length of the rope. Nevertheless, if there are enough strands, the rope holds, and we can climb. In astronomy the rope seems to be holding, but the climb is difficult and the top is far away.

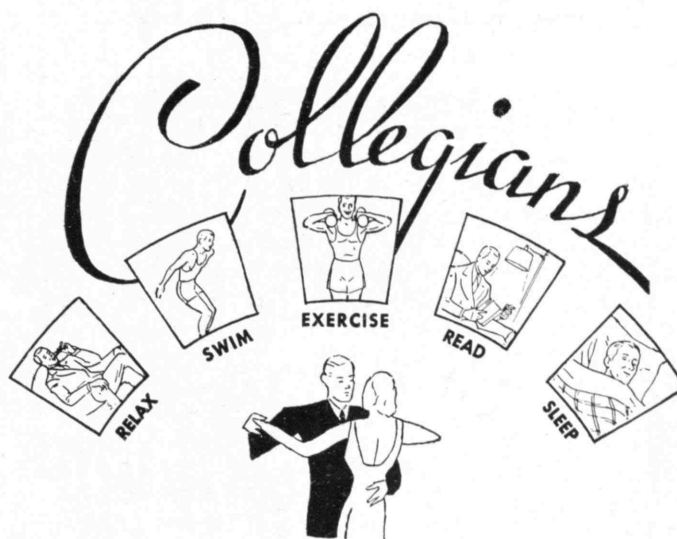
SCIENCE AND THE COLLEGE

(Continued from page 81)

and when lightning rods were being installed on many buildings, Franklin and his invention were vigorously assailed by the clergy as sacrilegious and tempting the wrath of God. For, argued they, was not lightning an instrument of punishment and admonishment in the hands of God, especially when skillfully dealt upon in their sermons for the purpose of inciting the fear of God in their congregations? These attacks on Franklin lasted for years. In a period of earthquakes in New England, the ministers were not slow to infer this evidence of God's wrath at having his lightning tamed by Franklin's rods.

Not only in the negative field of freeing men from superstitions and fears, whether attached to religions or otherwise, has scientific knowledge helped mankind spiritually; it has had the positive value of orienting him in his environment and showing him, in this environment, the marvelous order and coördination which pervades the infinite complexities of the world. In this way, science has a powerful cultural influence, if we are willing to accept the definition of culture as "sympathetic understanding and appreciation of life." Life has various aspects, emotional and intellectual. "Music hath charms to soothe the savage breast." In literature we have access to the finest thoughts and feelings of mankind. All of these, and religion, have power to bring us a mystical uplift of feeling. All contribute to true culture. Likewise does science. It, too, expresses symmetry of form and relationship. It, too, requires imagination. It, too, interprets life. In addition, it possesses a power and exercises a type of discipline which is unique. I would therefore place the advancement of knowledge through science as the most important contribution of science in education, and I would place, first, the cultural rather than the utilitarian values of this knowledge.

Next in importance, I would put the intellectual disciplinary value of scientific study and investigation. Franklin himself expressed this very clearly. Replying to a criticism of his theory of waterspouts, he wrote: "Nothing certainly can be more improving to a Searcher into Nature, than Objections (Continued on page 96)



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SCIENCE AND THE COLLEGE

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judiciously made to his Opinions, taken up perhaps too hastily: For such Objections oblige him to restudy the Point, consider every Circumstance carefully, compare Facts, make Experiments, weigh Arguments, and be slow in drawing Conclusions. And hence a sure Advantage results; for he either confirms a Truth, before too lightly supported; or discovers an Error, and receives Instruction from the Objector. In this View I consider the Objections and Remarks you sent me, and thank you for them sincerely."

He describes the true scientific spirit as follows: "I was too easily led into that error by accounts given even in the philosophical books. . . . But men are, in general, such careless observers, that a philosopher cannot be too much on his guard in crediting their relations of things extraordinary, and should never build an hypothesis on anything but clear facts and experiments, or it will be in danger of soon falling . . . like a house of cards." When some of his electrical experiments led him to distrust some earlier conclusions, he wrote: "If there is no other use discovered of Electricity, this however is something considerable, that it may help to make a vain man humble."

I have always believed that training as a scientist implants in the student certain habits of careful and logical thought that tend to protect him against irrational or emotional action and to improve his judgment

and administrative procedures. If this be true, then a strenuous course in science would be good training not only for a future scientist but also for a future businessman or public official. By way of illustration, consider Franklin's description of a striking sundial, which reads: "How to make a Striking Sundial by which not only a man's own family, but all his neighbors for ten miles round, may know what o'clock it is, when the sun shines, without seeing the dial: Chuse an open place in your yard or garden, on which the sun may shine all day without any impediment from trees or buildings. On the ground, make out your hour lines . . . taking room enough for the guns. On the line for one o'clock, place one gun; on the two o'clock line two guns, and so of the rest. The guns must all be charged with powder, but ball is unnecessary. Your . . . style must have twelve burning glasses annexed to it, and be so arranged that the sun shining through the glasses, one after the other, shall cause the focus or burning spot to fall on the hour line of one, for example, at one o'clock, and there kindle a train of gunpowder that shall fire one gun. At two o'clock, a focus shall fall on the hour line of two, and kindle another train that shall discharge two guns successively; and so of the rest. Note, there must be 78 guns in all. Thirty-two pounders will be best for this use; but 18 pounders may do, and will cost less, as well as use less powder. Note also, that the chief expense will be the powder, for the cannons once bought will, with care, last 100 years. Note, moreover, that there will be a great saving of powder in cloudy days.

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The third educational value of science is its practical utility. Perhaps the practical-minded Franklin would have placed this first. Most, though not all, of his scientific work was either stimulated by his desire to accomplish some useful end, or else had a utilitarian by-product. His extensive studies of the flow of air through pipes and past orifices were stimulated by his desire to design a more efficient stove and a convenient system of ventilation. His invention of bifocal spectacles sprang from his own needs. His construction of a naval towing tank and his experiments on the resistance of water to the motion of boat models were stimulated by his interest in promoting canal transportation.

On the other hand, his inventions of the lightning rod and an electrical method of slaughtering poultry and animals so that their meat would be more tender when eaten, were by-products of a long series of investigations on the nature of electricity and of electrical phenomena which he undertook primarily out of pure scientific curiosity and love of experimental research. Similarly, his identification and explanation of lead poisoning, his charting of paths of navigation on the Atlantic Ocean to take best advantage of the Gulf Stream and the trade winds and his method of calming stormy water by pouring oil on it — all these were the by-products of observations and studies not undertaken in the beginning with any immediate practical purpose in view.

The practical value of science is no less real today than in Franklin's day; if anything, it has been accentuated by such factors as increasing competition and the necessity for using and conserving our natural resources more wisely. Consider the great problems before our nation today, and you will see that many of them are inherently dependent on science for solution. To be sure, many issues are political, like the Supreme Court, or the Civil Service, or labor relations; others are financial, like reciprocal tariffs, taxes, and stock-market regulations. But there is a great group of problems such as employment; hours and wages of labor; conservation and utilization of national resources; protection against the hazards of flood, fire, earthquake, wind, and drought; development of new uses for farm products; housing; health; and many others — all of which are fundamentally dependent on science for solution. It is important, for the welfare of the country, that our colleges give young men and women a scientific training which will make them competent to contribute effectively to the solution of these problems. It is equally important that the rank and file of our population, and especially our future political leaders, be given a sufficient understanding of science to enable them to appreciate what science can do and what conditions are prerequisite to its effective operation.

(Continued on page 98)

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SCIENCE AND THE COLLEGE

(Continued from page 97)

The fourth educational value of science is that scientific work is pure fun to many people. Franklin, in 1747, wrote to his friend Collinson about some electrical experiments, and said: "For my own part, I never was before engaged in any study that so totally engrossed my attention and my time as this has lately done." Franklin pursued science, not as a step toward a B.S. Degree, or because he was hired to do it, or even because he thought he ought to do it, but because he enjoyed it. He not only enjoyed experimenting, theorizing, and applying his science practically, but he developed a quality of humor based on science. He loved to startle his friends with electric sparks or unexpected electrical phenomena. He carried a hollow cane secretly filled with oil with which he could smite the wavy waters of a lake and calm them, to the astonishment of his friends.

As a sample of his quasi-scientific humor, let me quote part of his communication to the editors of a Paris newspaper, while he was ambassador there in 1784: "Messieurs: You often entertain us with accounts of new discoveries. Permit me to communicate to the public, through your paper, one that has lately been made by myself, and which I conceive may be of great utility." He describes a party at which the efficiency of a new type of lamp was debated, and goes on to say: "I was pleased to see this general concern for economy, for I love economy exceedingly. I went home, and to

bed, three or four hours after midnight, with my head full of the subject. An accidental sudden noise waked me about six in the morning, when I was surprised to find my room filled with light; and I imagined at first, that a number of those lamps had been brought into it; but, rubbing my eyes, I perceived the light came in at the windows. I got up and looked out to see what might be the occasion of it, when I saw the sun just rising above the horizon, from whence he poured his rays plentifully into my chamber.

"I looked at my watch, which goes very well, and found that it was but six o'clock; and still thinking it something extraordinary that the sun should rise so early, I looked into the almanac, where I found it to be the hour given for his rising on that day. I looked forward, too, and found he was to rise still earlier every day till towards the end of June; and that at no time in the year he retarded his rising so long as till eight o'clock. Your readers, who with me have never seen any signs of sunshine before noon, and seldom regard the astronomical part of the almanac, will be as much astonished as I was, when they hear of his rising so early; and especially when I assure them, that he gives light as soon as he rises. I am convinced of this. I am certain of my fact. One cannot be more certain of any fact. I saw it with my own eyes. And, having repeated this observation the three following mornings, I found always precisely the same result.

"Yet it so happens, that when I speak of this discovery to others, I can easily perceive by their countenances, though they forbear expressing it in words, that they do not quite believe me. One, indeed, who is a learned natural philosopher, has assured me that I must certainly be mistaken as to the circumstance of the

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light coming into my room; for it being well known, as he says, that there could be no light abroad at that hour, it follows that none could enter from without; and that of consequence, my windows being accidentally left open, instead of letting in the light, had only served to let out the darkness; and he used many ingenious arguments to show me how I might, by that means, have been deceived. I owned that he puzzled me a little, but he did not satisfy me; and the subsequent observations I made, as above mentioned, confirmed me in my first opinion."

Franklin then calculates that 96,000,000 livres worth of candles are burned in Paris between March and September each year, and that all this could be saved if the people would rise at daybreak and go to bed at dark. He proposes some regulations to enforce this, and then goes on to say: "For the great benefit of this discovery, thus freely communicated and bestowed by me on the public, I demand neither place, pension, exclusive privilege, nor any other reward whatever. I expect only to have the honour of it. And yet I know there are little, envious minds, who will, as usual, deny me this, and say that my invention was known to the ancients, and perhaps they may bring passages out of the old books in proof of it. I will not dispute with these people, that the ancients knew that the sun would rise at certain hours; they possibly had, as we have, almanacs that predicted it; but it does not follow thence, that they knew he gave light as soon as he rose. This is what I claim as my discovery. If the ancients knew it, it might have been long since forgotten; for it certainly was

unknown to the moderns, at least to the Parisians, which to prove, I need use but one plain simple argument. They are as well instructed, judicious, and prudent a people as exist anywhere in the world, all professing, like myself, to be lovers of economy; and, from the many heavy taxes required from them by the necessities of the state, have surely an abundant reason to be economical. I say it is impossible that so sensible a people, under such circumstances, should have lived so long by the smoky, unwholesome, and enormously expensive light of candles, if they had really known, that they might have had as much pure light of the sun for nothing. . . ."

In this altogether inadequate fashion, I have tried to express certain thoughts on science and on education, and to cast these thoughts against the background of the great scientific patron of your college. Science has a valuable part in education because it creates knowledge, disciplines the mind, and has great utility. You may, because of these three values, study it from a sense of duty, or you may study it for fun. I suspect the latter is the real motive power and the former is the excuse behind most real scientists. But however it is viewed, science seems destined to occupy an increasingly significant place in our educational system. Through it, some will be enabled to add directly to our understanding of the world and our comfort in living. Its students will be better trained to view situations objectively, to draw rational conclusions from observed facts, to plan an intelligent course in the light of these facts and conclusions, and thereby to be safer citizens in our self-regulating society — our democracy.

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(Continued from page 74)

The food might be brown or purple or black, and was often smeared with ferrous sulphide. Red kidney beans sometimes came out blue. Brine had to be used in many packs to produce the required heat penetration quickly enough. These things do not, of course, happen today. Due to the insistence of canmakers, metallurgists have studied tin-plate corrosion, with the result that a more careful control of the amount of phosphorus and silicon in the steel has improved the tin plate unbelievably. Enamels have been developed which will withstand high temperatures and will prevent formation of metallic sulphides. Differentiation has been made between the types of enamel which are to be used for different kinds of food.

Early cans merely had a lap seam which had to be very thoroughly filled with solder. Some European canmakers still make such seams. Modern American canmakers employ a lock-and-lap seam which keeps all the solder on the outside and has, to all extents and purposes, made its use unnecessary. The solder, instead of being a rough sort of seal, is almost invisible. Tops are locked on and sealed by a gasket of special rubber compound developed specially for the canmaker to replace the old hole-and-cap type of top and made widely available by the Dewey ['09] and Almy ['10] Chemical Company of Cambridge. All these developments have permitted a tremendous speed-up in production.

But even more dramatic changes have taken place in the canning processes themselves. The canmakers, it must be remembered, do not can foods. What they do is to supply the canners with machinery for making the packs, on a lease and license basis. It is therefore the canmaker who has developed the complex canning machinery of today. One machine in which Mr. Taylor takes special pride is a salmon canner, which engulfs a whole salmon, decapitates and decaudates it, skins it, blows out its viscera, cuts it into pieces, deposits them in the can, sterilizes them, and seals the can. More recently the discovery has been made that stratified products such as spinach, asparagus, and green beans can be processed better if attention is paid to the axis of stratification. These developments in precision can be largely attributed to the canmaker.

A modern canmaking plant is a noisy place. It is also an exciting place. Through it, in general, run two types of cans. Those cans which are to be used for food packs, the canmaker calls his sanitary cans. Such cans are shipped to the canner open, with an equal number of tops for him to apply in the canning machines supplied by the canmaker. As a rule they are unlabeled. The other cans are called the general line and are usually shipped as a complete package, and these the canmaker must also decorate. (This, too, he must do with the new beer can.) General-line cans pose additional problems in package design and decoration; sanitary cans pose additional problems in greater airtightness. Either type starts as tin plate, and because today almost all cans are lacquered both types must pass through a painting or printing operation.

The machinery and conveying system of a modern canmaking factory constitutes an outstanding and dra-

matic example of contemporary mass production — perhaps the outstanding example. Most amusing, perhaps, is to see sheets of tin plate being printed with identical imprints of six packages, often in several colors simultaneously, being lifted by vacuum-cup fingers, being demagnetized, being accepted by humanlike feelers which drag them through a dryer, being crosscut and slit to form flat sheets for six cans. Noisiest and most dramatic is the behavior of these sheets on the Gatling-gunlike forming machine where they are whisked around a cylindrical mandrel and lock-seamed quicker than the eye can follow, pulled along the mandrel to a soldering trough (there are several other soldering devices) by mechanical fingers, poured off the end in a Niagara-like flood at the rate of 300 a minute. Most interesting scientifically is the great testing machine which examines each can as it passes around the periphery of a turret in close embrace with a header through which the airtightness of the can is tested so accurately and with rejection so automatic that the canmaker may guarantee to his purchaser sure performance of 998 in every 1,000 cans he ships. Of greatest human interest is the loose-packing method as employed in boxcars. Here the conveyor comes right down to the car floor where it levels off. Two young men, with many-pronged wooden rakes, unerringly sweep up a covey of cans, one for each prong, and neatly deposit them in mounting rows in the car.

Now when a production line is turning out 300 cans a minute and you are a boy in a boxcar on a cellar siding, into which cans are being disgorged at that rate, you might have some fears as to what would happen if you got a cramp in the arm. If you were well read in your mythology, as probably you would not be, you might recall the story of the salt grinder and wonder whether, if you stuck to the job long enough, you would not some day find yourself smothered by a pile of unruly cans. Probably less out of regard for this eventuality than because of the danger to the delicate machinery above, the canmakers have created a series of solenoid stations which react at the right times and more surely than humans. And seeing a canmaking line going through a solenoid-controlled, progressive shutdown is perhaps the slickest observation you can make in a modern can factory.

Five years ago all these achievements had been made and the canmakers were doing very well, thank you, even if we did have a depression. But Mr. Taylor is never satisfied, and so he had to get busy with the beer can. And that has started a very interesting sequence of events. The development of the beer can itself makes a pretty interesting, though by now perhaps a twice-told, tale. It was by no means so simple as a-b-c. The beer can, among other things, was the first metal container developed for a pasteurized or sterilized product which at room temperatures normally shows pressure rather than vacuum within the container. It involved the creation of stronger side seams and stronger ends. The side-seam problem was solved by letting the trapped gasses escape from it and permitting the solder to flow through the seam. The present beer-can end required the creation of a specially treated tin plate. A proper enamel lining had to be developed, and this lining also had to be uniform. This involved the use of methods of measure-

ment of thin linings which were developed at Technology. Finally, methods of baking the enamel had to be investigated, with the result that it is applied in two coats, a thicker one while the metal is flat and a thinner one after the can is formed. The latter, in turn, meant developing a new spraying nozzle. Baking was difficult because the temperature could not be enough to melt the solder in the side seams but must be enough to dry the sprayed inside enamel. Solvent fumes had to be eliminated. However, we have the beer can and a very popular can it is, too.

Of more concern to our tale is the potential canning and canmaking. In the first place, while tin has been reasonably satisfactory as a coating, it seems possible that the tin can need no longer be made of tin. The promise of lacquers is great and with their development the need for tin disappears. Today the canmakers have developed enamels that not only protect the pack from discoloration and the taste from corroded tin plate but also are themselves free from any ingredients that can impair the flavor of the pack. No longer does the canmaker expect one enamel to serve for all kinds of foods. Fruits, vegetables, meats, fish, citrus fruit juices, beer, wine — each product has its specific chemical peculiarities that require a special enamel to preserve the special characteristics of the fresh food.

Again, canmakers today understand much more about the baking of the enamel onto the can and the importance of polymerization as well as oxidation in producing resistance to the various foods. With many of the new synthetic resins which are incorporated in the can enamels, oxidation plays no part in baking them to the tin plate. All these developments suggest the possibility that someone will succeed in developing a coating of organic nature that can be successfully bonded to the steel base and may make a tin coating unnecessary. For it is possible to make organic coatings that are less affected by contact with food products than is any metal coating yet discovered which can be obtained and applied to the can at a cost that makes it commercially practicable.

However, the most imminent change is in the flavor of the foods canned. This is implied in all the proposals for "flash sterilization," on which there are upwards of 50 patents. It is now well known that, as the temperature of sterilization increases, the rate of death of microorganisms increases in more than straight-line ratio. This is significant, for present temperatures and present sterilizing times necessarily result in cooking the food. We speak of tomato, grapefruit, or pineapple juice, but we are really talking of tomato, grapefruit, or pineapple soup.

If methods could be devised for sterilizing much more rapidly — say at much higher temperatures, such as 300 degrees — it might be possible to retain more of the original flavor. Coupled with this would be, of course, the necessity for eliminating the conductivity of the food as a factor, for in such rapid sterilization the heat must evidently reach the most remote points rapidly. Flash sterilization may be easily remembered as a coming process by a loose analogy with the rapid-freezing process with which we are now all familiar.

(Concluded on page 102)

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(Concluded from page 101)

American Can has gone down a new alley in developing a rectangular fiber container for daily deliveries of fresh milk. Here is a market for a single-trip container for which no deposit is required and no returns necessary for the purchaser. It keeps the dairy bacteriologically free from contact with the house — a public health consideration, particularly where communicable diseases are involved. It obviates recleaning and sterilization of the present reuse containers.

A fiber can was chosen because of its low cost, light weight, ease of disposal, and protection of the product from deterioration due to sunlight. A square design was selected, both for speed of production and utility. The square containers could be packed solidly in a shipping carton, economizing on space and offering insulation against temperature rise during transportation. The closure cap was made integral with the top so that it could be closed under the sterile conditions of the factory and kept sealed until used in the dairy. It was mechanically opened in the dairy and resealed after filling. Even the character of the raw materials used in the container could be controlled to insure a sanitary container: virgin pulp, mechanical handling with a minimum of manual contact, thermoplastic cements, paraffin coating for waterproofing and aiding insterilization. These containers are already familiar to residents of Manhattan. Thus the canning business pokes its head around another corner, one which visions the first significant change in materials for cans since tin plate began to compete with glass.

In developing new sterilization techniques, some attention will, undoubtedly, be given to the use of radiation, such as the ultraviolet portion of the spectrum, to supplant present methods of processing. Such application, however, will be limited probably to those free-flowing liquids which are not particularly opaque to light of short wavelengths. Then there is the possibility of the generation of sterilizing temperatures within the can by electrical methods, although the results, to date, have not been promising.

In creating ever-widening markets for canned foods (and tin cans), science takes into consideration the importance of color, along with texture and flavor, as a factor in our choice of foods. Rather than reverting to the obvious makeshift of artificially dyeing food, chemists are seeking ways of applying our new-found knowledge of the chemistry of chlorophyll — the organic pigment that gives our green vegetables their color. Knowing that chlorophyll hydrolyzes or splits apart at process temperatures at the pH value of most foods, there is some hope of devising ways and means of retaining the original brightness of color of the food through pre-treatment and pH control in the can.

If these processes prove their worth consistently and for a large number of foods, the names of their developers will be placed on the honor roll with those of Prescott, Pasteur, and Appert. The latter citizen of the First French Republic would undoubtedly view with amazement the billions of cylinders of tin, rolling along a highway whose foundation was that thin little book of 1810.

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TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Committeemen and Candidates

¶ WILLIAM C. POTTER '97, chairman of the board of the Guaranty Trust Company, New York City, nominated to a directorship on the board of the Federal Reserve Bank of New York, September 25.

¶ GEORGE E. RUSSELL '00, Professor of Hydraulics, appointed to the advisory board of the United States Coast Guard Academy at New London, Conn., in April.

¶ SAMUEL C. LIND '02, dean of the Institute of Technology of the University of Minnesota, one of seven nominees for the presidency of the American Chemical Society. Two other Technology nominees for this office were CHARLES A. KRAUS '08 and PER K. FROLICH '23. The vote had not been taken at this writing.

¶ FRANK B. JEWETT '03, President of Bell Telephone Laboratories, appointed to the committee on scientific aids to learning of the National Research Council, in June. Also on this committee is VANNEVAR BUSH '16, Dean of Engineering.

¶ JOHN C. KINNAR '07 and CARL J. TRAUERMAN '07, reelected to the western governing board of the American Mining Congress, in September.

¶ TENNEY L. DAVIS '13, elected chairman of the history of chemistry division of the American Chemical Society, in October. At the same meeting, WALTER G. WHITMAN '17 was reelected associate editor of *Technologic Monographs* and named to the executive committee of the industrial and engineering chemistry division; HOYT C. HOTTEL '24, to the executive committee of the gas and fuel chemistry division; ERNST A. HAUSER, Staff, secretary-treasurer of the colloid chemistry division; and GEORGE SCATCHARD, Staff, chairman of the physical and inorganic chemistry division.

¶ LEWIS W. DOUGLAS '17, former director of the budget at Washington, appointed principal and vice-chancellor of McGill University, Montreal, Canada, in October.

¶ ARTHUR C. HARDY '18, reelected a member of the board of governors of the Society of Motion Picture Engineers, in October.

¶ BRUCE E. STEWART '22, chosen Boy Scout executive of the Cape Cod Council, in September.

¶ WILLIAM HOVGAARD, Professor Emeritus, appointed to the Navy's advisory board on plans for two new battleships, in October.

Written

¶ By HENRY D. HIBBARD '77, "Steel Reminiscences," *Metals and Alloys*, January through May.

¶ By ADDISON F. HOLMES '04 and HERMAN G. PROTZE, JR., '32, "Test of Precast Concrete Floor Units," *Engineering News-Record*, September 23.

¶ By DELOS G. HAYNES '09, "Letter on Administration of Foreign Patent Offices," *Journal of the Patent Office Society*, October.

¶ By ERNEST H. HUNTRESS '20, "Daily Chemical Anniversaries as a Teaching Tool," *Journal of Chemical Education*, July.

¶ By WALTER M. FIFE '21 and JOHN B. WILBUR '26, "Theory of Statically Indeterminate Structures," McGraw-Hill Book Company, Inc.

¶ By S. PAUL JOHNSTON '21, editor of *Aviation*, a series of articles entitled, "The Science of Model Airplanes," for Junior Birdmen, during the fall.

¶ By HERMON H. SCOTT '30, "Designed for Use," *Electrical Manufacturing*, October.

Honorary Degrees, Fall Edition

¶ To WARREN K. LEWIS '05, a D.Sc. from the University of Delaware, October 16.

¶ To KARL T. COMPTON, President, an LL.D. from Franklin and Marshall College, October 14.

In the News

¶ HERVEY J. SKINNER '99 and HERBERT L. SHERMAN '02, President and Treasurer, respectively, of Skinner and Sherman, Inc., mentioned in the Boston Sunday *Herald*, October 10, as detectives who never carry a gun. Their research chemists work on problems of criminal detection, as well as commercial analysis.

¶ J. HOWARD PEW '03, in *Compressed Air Magazine*, July, for stating before The Franklin Institute that "there is no reason for apprehension over the reserves [of oil in the United States] still remaining in the ground."

¶ CLARENCE D. HOWE '07, Canadian minister of transport, in the Christian Science *Monitor*, October 20, as "Canada's busy Mr. Howe . . . one of the busiest of all Dominion cabinet ministers."

DEATHS

* Mentioned in class notes.

¶ EDGAR S. DORR '75, October 5.

¶ FRANK P. TENNEY '75, February.

¶ JOSEPH M. WILSON '76, December 31, 1936.

¶ EDWIN J. LEWIS, JR., '81, October 16.

¶ EDWARD A. CUDWORTH '88, April 16.

¶ CYRUS C. BABB '90, October 2.*

¶ FRANCIS H. KENDALL '90, October 7.*

¶ STEPHEN L. COLES '91, May 7.

¶ WILLIAM C. HAWLEY '91, August 16.*

¶ FRANCIS G. HOWARD '92, June 27.

¶ EDWARD S. BAUMANN '93, December 8, 1936.*

¶ EDWARD B. CARNEY '93, October 20.*

¶ CHARLES H. SMITH '98, October 1.

¶ GEORGE H. RIKER '99, September 22.

¶ CHARLES F. WILLARD '01, October 2.

¶ RALPH S. GIFFORD '05, September 18.*

¶ WILLIAM H. SAGE, JR., '07, April.

¶ ALEXANDER H. BRADFORD '08, September 21.

¶ GORTON JAMES '10, October 9.*

¶ JOHN GLAZE '12, September 3.

¶ WALTER V. MURPHY '14, August 21.

¶ HENRY C. CLAYTON '17, September 5.*

¶ FRANCIS E. BAKER '25, September 15.*

¶ GEORGE W. SENSENICH '25, February.

¶ RICHARD ORLEMAN '30, October 8. (See Florida club notes.)

¶ THOMAS E. KENT, JR., '34, July 18.

¶ RICHARD BABCOCK '35, October 26.

¶ CLAUDE H. CLARK, former Staff, October 3, after a brief illness at his summer home in Windsor, Vt. Mr. Clark was in our Department of Mechanical Engineering from 1918 to 1934.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Vermont Meeting

On October 16, Vermont Alumni were the guests of Birney C. Batcheller '86 at the True Temper Inn in Wallingford, Vt. Alumni from all parts of the state assembled to discuss with Redfield Proctor '02, member of the Executive Committee of the Corporation, the new developments at Technology, especially the Alumni Fund Drive for improved recreational facilities. Ralph T. Jope '28, Secretary of the Advisory Council on Athletics, showed lantern slides of the proposed recreational buildings. All Alumni present expressed their appreciation and thanks to Mr. Batcheller for his generosity and loyal Tech spirit in sponsoring this meeting and the hope that it would mark the beginning of a Technology club of Vermont.

The following Vermont Tech men were present: Birney C. Batcheller '86, Wallingford; Redfield Proctor '02, Proctor; Barth R. De Graff '28, Rutland; Henry W. Clement '90, Rutland; Miles V. Hayes '34, Rutland; Walter T. Biggar '18, Burlington; Robert B. Follansbee '32, Rutland; Amery L. Williams '18, Woodstock; Richard L. Gouchoe '34, Rutland; Henry C. Belcher '98, Proctor; John P. Davis '06, Montpelier; Alan W. Bartlett '36, Jamaica; Allen L. Briggs '25, Rutland; John Lawrence '32, Springfield; William E. Caisse '21, Burlington; George H. Burrows '14, Burlington.

M.I.T. Club of Akron

The first meeting of the year was held at the Village Tavern in Stow, Ohio, on October 18. Following an excellent dinner, a film, "The City of Tomorrow," was shown. This was accompanied by a recorded lecture by Professor McClintock of Harvard. His discussion of present-day traffic problems and their possible solution in the future was entertaining as well as instructive. The evening was concluded with an informal gathering. The unusually large attendance — 55 — was gratifying to the officers and committee, and we are looking forward to an active year. — JOHN H. FIELDING '25, Secretary, 533 Letchworth Drive, Akron, Ohio.

Technology Club of Eastern and Northern Maine

Alumni in the Bangor area held their second dinner meeting of the year on October 14 in the Oak Room of the Bangor House. Harold S. Boardman '96 acted as chairman and introduced the guest speaker, Walter G. Whitman '17, Head of the Institute's Department of Chemical Engineering. Professor Whitman gave an

interesting account of recent developments at M.I.T. and, in response to questions from the audience, gave information on certain points of particular interest, such as the new plan for stabilization of enrollment in the various Courses. An additional feature of the meeting was the showing of two reels of Edgerton high-speed motion pictures, prepared at M.I.T. and loaned through the courtesy of Charles E. Locke '96, Alumni Secretary.

Those attending the meeting were Gertrude E. Ebbeson '33, F. E. Bragg '97, H. S. Gardner '30, R. H. Hysom '19, W. C. Peters '02, and R. P. Whitney '35 of Bangor; P. F. Eckstorm '30 of Brewer; H. T. Clark '23 and W. E. Robinson '32 of Dover-Foxcroft; H. S. Boardman '96, H. D. Chase '23, W. L. Gilliland '25, M. E. Highlands '34, L. C. Jenness '37, A. C. Lyon '04, and W. J. Sweetser '01 of Orono; P. B. Stinson '37 of Rockland; R. R. Whitehouse '21 of Unity; and C. A. Redden '24 of Waterville. The following group of graduate students from the Bangor field station of the M.I.T. School of Chemical Engineering Practice also were present: A. C. Faatz, Jr., '37, E. L. Howard, H. P. Milleville, M. D. Parekh, N. A. Sabi '37, R. E. Schneider '37, G. Skaperdas, and W. L. Slade.

In view of the interest indicated by favorable replies to a questionnaire regarding the formation of a club organization, it was unanimously voted to elect Messrs. Bragg, Chase, Gardner, Howe, and Peters as a governing board to select their own officers and to conduct the affairs of the Club. — HOWARD S. GARDNER '30, Acting Secretary, M.I.T. School of Chemical Engineering Practice, Eastern Manufacturing Company, Bangor, Maine.

Technology Club of Southern California

Local Alumni turned out 42 strong on the evening of October 20 to hear B. Alden Thresher '20, Director of Admissions, say something about his work and about the Institute and student activities in general. This he did in a very pleasing and illuminating manner. Before Professor Thresher was given an opportunity to sound off, officers for the ensuing year were elected as follows: William H. Robinson, Jr., '24, President; Charles H. Toll, Jr., '23, Vice-President; Ralph B. Atkinson '29, Secretary-Treasurer. — RALPH B. ATKINSON '29, Secretary, 6706 Santa Monica Boulevard, Los Angeles, Calif.

Technology Club of South Florida

Richard G. Orleman '30, son of Mr. and Mrs. Carl S. Orleman, 9600 North Miami Avenue, died in New York on October 8. Richard had been with the

firm of Jackson and Moreland, construction engineers of Boston, for the last seven years. He was a member of the University Club of Boston, American Society of Mechanical Engineers, and the Tau Beta Pi, honorary fraternity. He is survived by his parents, three sisters, and three brothers, one of whom, Carl, was in the Class of 1931 at Technology. At the burial service in Miami, Fla., eight members of the Club served as pallbearers: George E. Batcheller '10, B. Howard Brown '30, Ray C. Burrus '22, Albert H. Clark '22, John W. Hoover '32, John J. Ostlund '35, Clarence P. Thayer '23, and Charles S. Symonds '34.

Membership in our Club now numbers almost 60 and with the help of each former M.I.T. student in this area, the Club will be a success. In January we are hoping for a great meeting, with Dr. Compton as our guest. He expects to visit Miami while on tour of the country in the interest of the Alumni Fund for the construction of facilities for student activities, and we are honored that Miami is included in his plans. — Last season we just missed a Babson session. Roger Babson '98, in addition to being United States prognosticator Number 1, is a Technology enthusiast. We have high hopes that he will accept our invitation to address the Club in February.

When you read about the \$2,500,000 the city of Miami Beach is spending for new streets, a new sewage disposal system, and other municipal improvements, remember that Morris Lipp '20 is in charge of the whole program. — Through activity of our Club, two Technology men received good positions during the year. If we accomplished nothing else, this assistance to Tech men has justified our organization. — We regret that several members have moved from our district: John W. Jewett '32 has been transferred to Puerto Rico. Myron L. Williams '32 should now be a member of the Jacksonville club; he moved there two months ago. W. A. Boland '36 is also in Jacksonville, having been appointed meteorologist at the airport weather bureau.

Last year David Morgenthaler '40, a graduate of Ponce de Leon High School, Coral Gables, was one of the five best students in English at the Institute. In recognition of this accomplishment and as a part of the program to strengthen the relationship between secondary schools and Technology, Ponce High was the recipient of a Technology Award volume. The writer was privileged to present the award — "The Flowering of New England" — to the Ponce de Leon High School student body at their assembly on October 7.

The Fort Lauderdale High School also has a record-maker at Technology: Martin Adolph Antman '40 ranks in the

first nine per cent of his Class. We have asked Captain William E. Parker '99 to speak for the Club in congratulating the Fort Lauderdale High School on Mr. Antman's record. We are pleased to have Messrs. Morgenthaler and Antman call attention to the high standing of South Florida high schools. — CLARENCE P. THAYER '23, *Secretary*, 1760 Northwest 41st Street, Miami, Fla.

Technology Club of New York

A highly successful alumni smoker formally opened the active fall season of the Club on October 21. Before an enthusiastic audience of over 250 club members and Alumni, President Compton fired the opening gun in Technology's \$1,650,000 Alumni Drive to enrich student life. Dr. Compton, sketching a brilliant picture of Technology's educational and research advantages, explained the need for further recreational facilities for the students. The facilities for sports, dramatics, and recreation included in the proposed plans, he pointed out, will not only supplement the Institute's efforts in turning out well-rounded graduates but will attract promising students.

President Compton was introduced by Thomas C. Desmond '09, General Chairman of the Alumni Drive and former President of the Club. Senator Desmond, in turn, was introduced by Marshall B. Dalton '15, President of the Alumni Association. Also present were Elbert G. Allen '00, director of the campaign, J. Rhyne Killian, Jr., '26, editor of The Review, and John J. Rowlands, publicity director of the Institute, who answered queries and received suggestions concerning the campaign. Alfred T. Glasett '20, President of the Club, assured the committee that it could depend on the New York district to fulfill its quota 100%, and his statement was received with wide applause and cheers from the audience. Following the speeches, the meeting adjourned to the social rooms of the Club for refreshments. Over glasses of rich, foamy beer and pretzels, the members and guests renewed friendships and acquaintances and recalled fond memories, far into the night.

The annual contract bridge tournament opened on October 26, with more than 30 men competing. There were five sessions, closing on November 30. — The employment division, under John C. Fruit '02, is enjoying fine success. At present there are many positions available for which there are insufficient qualified applicants. — Another big jamboree is planned for some time this month.

The Club's membership continues to mount. A special questionnaire sent out recently has resulted in answers showing wide interest in activities and future plans. This interest will undoubtedly result in increasing the Club's social sphere and facilities, so that it will become an even more valuable adjunct to the life of Technology men in this section. — CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

M.I.T. Club of Northern New Jersey

Believe it or not, our mailing list, in its short life, has grown to 1,209 and is still climbing. Attendance at the various meetings held since the formation of the Club three years ago has in each case been well into the hundreds. Activity for this season, up to the time of this recording, exhibits a growing M.I.T. consciousness on the part of those receiving notices.

For example, to test a regional plan of meeting, proposed because some members indicated that Newark should not have all the glory, Ridgewood was selected. Ridgewood has a mailing list of 33; October 13 was the fatal night. Lo! On that date there were 37 Tech men at the Ridgewood Elks' Club, enjoying a pleasant evening — without speeches or formality, but with good food, good moving pictures from Cambridge, and good fraternity. Sumner Hayward '21 was the guiding spirit of this assembly, and the meeting will be repeated in kind elsewhere in northern New Jersey territory on the least provocation.

The first smoker of the year was originally scheduled for November 3. However, when it was learned that Dr. Compton could be in Newark on November 16, the latter date was made definite. A more complete reference to this event will, through the necessity of the publication date of The Review, have to wait for later notes.

The various committees, including that for the Alumni Fund, are proving their effectiveness. The luncheons on the second Thursday of each month at the Newark Athletic Club continue to be attractive to a congenial group. — A. RAYMOND BROOKS '17, *Secretary*, Wayside, Brantwood, Summit, N. J. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N. J.

Technology Club of Rochester

This year the national convention of the American Chemical Society was held in Rochester from September 6 to 10. In honor of the many visiting Alumni of M.I.T., we held a special luncheon at the University Club on September 9. Almost 100 men gathered there for an hour of rest and refreshment. No set program was planned, but many acquaintances were renewed and memories revived.

The second annual summer alumni prom was held at the Monroe Country Club on Saturday, September 25. A hostess committee composed of Mrs. L. L. McGrady as chairman and assisted by Mrs. Richard Morse, Mrs. E. Philip Kron, and Mrs. Robert E. Smith arranged the novel decorations of several bouquets of large red zinnias in the midst of silvered holly leaves, accented by cardinal tapers. The table was set up in the form of a large T with the Chairman, Philip Kron, '34, and the President of the Club, Andrew Langdon '22, sitting at the head of the table with Mrs. Kron and Mrs. Langdon.

Surrounding them were the committee, which consisted of Richard Wilson, '30, Glen Goodhand '31, and Richard Morse '33, with Mrs. Wilson and Mrs. Morse. Others attending included Major and Mrs. Bowlin, Mr. and Mrs. Henry Couch '20, Mr. and Mrs. Gerould T. Lane '13, Mr. and Mrs. Richard Jackson '30, Mr. and Mrs. Edmund Miller '23, Oliver Angevine, Jr., '36, with Miss Helene Berman, Mr. and Mrs. Emery Low '29, Harold Ahnfeldt '33 with Miss Elizabeth Hayes, Roger Brookman '35 with Miss Carol Horton, David Babcock '33 with Miss Luella Marsh, F. L. Higgins '04, Miss Mary Higgins, Daniel B. M. Finucane '36, Miss Helen Shedd, Joseph Parks, Jr., '28, and Mr. and Mrs. Robert E. Smith '33.

After a delicious dinner, the orchestra played for dancing, opening with "Take Me Back to Tech," under the able baton of Henry Couch. The orchestra next swung into a college medley, and the dance was on, not to end until many an old grad had slipped home and the clock announced the end of another delightful evening. — On October 9 a group of about 40 Alumni gathered at Bill Vicinus' ('23) summer home for the annual meeting. After several contests of a semi-athletic nature, the customary ball game between the odd and even Classes took place, which went on and on until darkness ensued with the even Classes the victors. Bill Vicinus presided at the fireplace, as usual, and furnished us with steamed clams direct from Boston, followed by lobster, and topped off with pumpkin pie. He received a most deserved vote of thanks. The annual business meeting and election of officers followed, with Edward S. Farrow '20 elected the new president. — CECIL ARONSON '22, *Secretary*, Building 52, Kodak Park, Rochester, N. Y.

Washington Society of the M.I.T.

Members of the Society listened with keen interest to George W. Lewis, director of aeronautical research, National Advisory Committee for Aeronautics, as he outlined "What's Happening in the New Science of Aviation," at our regular luncheon meeting at the Cosmos Club on Friday, October 15. Attendance established a new high for the current year, reaching a total of 65 members and guests. President Tyler '84 presided.

At the executive committee meeting, held immediately after the luncheon, plans were outlined by Amasa M. Holcombe '04 for making an effective canvass of all society members in connection with the program for improving the recreational facilities of the Institute, as outlined in President Compton's letter to Alumni in October.

The following members were present: D. P. Allen '11, C. H. Godbold '98, J. Y. Houghton '26, F. W. Swanton '90, F. W. Willcutt '27, A. E. Hanson '14, J. G. Riley '06, G. Rogers '02, J. C. Damon '05, E. M. Lee '25, L. C. Reyna '23, E. P. Roll, Jr., '23, M. H. Naigles '21, W. I. Swanton '93, A. Pope '07, A. F. O'Don-

nell '19, S. Bensinger '31, K. French '26, H. E. Weihmiller '25, W. H. Hubbard '00, P. A. Blair '05, G. Q. Voigt '29, B. A. Howes '97, J. C. Dort '09, E. Hahn, '09, G. D. Mock '28, F. E. Fowle '94, G. W. Stone '89, H. L. Woodward, Jr., '34, G. R. Hopkins '22, W. K. MacMahon '22, C. P. Kerr '11, M. M. Holcombe '36, A. M. Holcombe '04, R. C. Platt '31, S. D. Berman '27, W. H. Weeks '31, R. W. Riefkohl '09, J. G. Bowen '30, M. W. Hammond '23, O. L. Hooper '23, H. B. Swett '25, E. H. Lloyd '33, H. L. Robb '21, L. W. Conant '21, L. J. Grayson '19, H. D. Randall, Jr., '31, P. Weeks '02, H. W. Tyler '84, J. W. Clary '96, E. F. Enright '17, F. P. Upton '16, E. D. Merrill '09, P. L. Dougherty '97. We were glad to receive as guests: T. Hayward Brown, Mississippi State '24; L. T. Fournier, British Columbia '21[?]; George F. Maddock, Stanford '00; C. A. Faich; J. R. McQueen; Horace S. Woodward; Ed Ryder, Michigan '33; Harry B. Jordan, Colonel in United States Army; A. F. Zahm; G. W. Lewis; and W. P. McCracken. — LAWRENCE W. CONANT '21, Secretary, 3008 Ordway Street, Northwest, Washington, D.C.

Worcester County Alumni Association of the M.I.T.

The first 1937-1938 meeting of the Association was held on Tuesday, October 19, at Hotel Bancroft, Worcester. Karl T. Compton was the guest of honor. In his usual interesting style, he outlined plans for the Institute. Among the new equipment mentioned was the modern wind tunnel to be dedicated next fall in memory of the Wright brothers. The Alumni Drive for student recreational and activity facilities was also mentioned. Julius Neumuller of the American Optical Company demonstrated the reactions of the human eye to various tests, and showed extremely interesting movies of the eyes in action.

The following committee to contact men for the Alumni Drive was appointed by President Denison '11: Howard R. Stewart '17, chairman, F. Harold Daniels '11, and Robert G. Clarke '35, all of Worcester; Charles E. Allen '07 of Spencer, Andrew B. Sherman '02 of Fitchburg, Robert J. Proctor '28 of Leominster, Erceel A. Teeson '15 of Southbridge, and Thomas P. Kelly '18 of Gardner.

Others of the 57 members and guests present were Howard F. Atwood '32 of Bolton; Francis T. Akin '38, Robert H. Brown '22, Wallace S. Crowell '32, Charles E. Cashman, Jr., '33, and Fred N. Dillon '93 of Fitchburg; Harold O. Berry '22 and Harry S. Kendall '04 of Gardner; Robert T. Dawes '26 and Fred B. Dawes '98 of Hudson; Clarence M. Joyce '03 of Leominster; Edgar W. Norton '98 of Shrewsbury; W. Franklin Baxter, Jr., '34, Alanson G. Bowen '33, John S. Middleton '29, Carl H. Wilson '34, and C. Samuel Woodruff '31 of Southbridge; Ralph G. Mahoney '18 of Sterling.

Mainly from Worcester came Erving G. Betts '18, Percy J. Colvin '07, Hamilton L. Davis '31, Lewis Davis '12, Daniel P.

Dyer, Jr., '32, Ralph F. Gow '25, Robert H. Haberstroh '31, Albert S. Heywood '92, Frank C. Howard '17, Albert J. Hoyt '14, William A. Hyde '04, Arthur W. Johnson '14, A. E. Jorjorian '30, Arthur J. Lariviere '35, Myles Morgan '23, George Manter '31, Norman C. Nelson '30, John A. Swift '27, J. Weston Pratt '24, Robert S. Pride '29, Carleton A. Read '91, Harold L. Robinson '11, Percy M. Roope '27, Louis E. Vaughan '02, Lewis S. Vose '16, and William A. Wilder '98. Kenneth Reid '18 came from New York City; other guests were C. L. Peake of Leominster and Kenneth Macomber of Hudson. — JOHN A. SWIFT, '27, Secretary, 15 Stoneland Road, Worcester, Mass.

CLASS NOTES

1876

Theodore J. Lewis was born in Altoona, Pa., on October 8, 1855, and died on April 14. The son of Enoch and Charlotte Thorn Lewis, he was of the seventh generation of this Lewis family in America, of old Welsh stock, the earliest records showing the first of this family to have been in Pennsylvania in 1682. On his mother's side he was directly descended from one William Thorn, who came from England and was made a freeman at Lynn, Mass., on May 2, 1638.

After graduation Lewis worked for the Pennsylvania Railroad in their shops at Altoona, Pa. Most of his active business life was spent with the Standard Steel Works, a subsidiary of Baldwin Locomotive Works. He was secretary and treasurer of Standard Steel Works for many years, until he retired from active business. The last 30 years of his life were devoted to philanthropic and civic work in Philadelphia. He was president of the Octavia Hill Association for better housing of the poor, for many years, and was a trustee of the Harrison Foundation.

Surviving Mr. Lewis are his wife, nee Anna Burnham, his daughters, Mrs. Josiah O. Low of Chestnut Hill, Mass., and Mrs. Edgar L. Smith of Upper Montclair, N.J., and his sons, Theodore B. Lewis of Freehold, N.J., and Burnham Lewis of New York, N.Y. — CHARLES T. MAIN, Secretary, 201 Devonshire Street, Boston, Mass.

1877

Edward Winslow Davis, son of George Hubbard and Sarah Cleverley Davis, a direct descendant of John Alden, died on September 1, at his home, 25 Kirkstall Road, Newtonville, Mass. He was born in Boston, Mass., June 10, 1855. He entered Technology in the Class of 1876; but after an illness, left Tech in the fall of 1874. Upon regaining his health and after a trip to Europe, he went to work for his father, who was proprietor of a piano business, as assistant superintendent, in which position he continued until December, 1879, when the death of his father turned the business into the Hallett and Davis Piano Manufacturing Com-

pany. He remained with this company from August, 1880, to 1897, as superintendent, when the failure of the company and his ill-health kept him from active work. In December, 1898, however, he entered the business of printing and publishing in which he continued until the time of his death. He married in May, 1881, Caroline L. Esbach of Boston. They had no children, and he is survived by his wife.

There follows the beginning of Bacon's letter to Moran to which we referred in the last issue: "I left Boston Tech in 1876, aged 20, having finished the special course in architecture under Prof. Ware. Spent that winter in North Carolina, assistant to my father, United States government engineer on Cape Fear River. In spring of 1877 came to New York on my way to Boston, to try for a job in some architect's office. Decided I would have a better chance remaining in New York, so with a portfolio of sketches under my arm, called on architects from Battery to Union Square, which was then considered uptown. Finally landed in Carl Pfeiffer's office at \$2.00 a week. McKim, Mead, and Bigelow next door at 57 Broadway were very busy, and through John duFais I got a chance to work evenings for that firm, and what a change from Pfeiffer's!

"McKim would take us out for supper, tell stories of Paris and Europe, and afterwards we would work like beavers. I told them I was after a better job than Pfeiffer's and one day Mr. Mead sent for me and said there was an opening in Albany with a Mr. Prentice Treadwell at \$15 a week. Would I go? I surely would, and presently found myself installed as head draughtsman — I, who had never made a detail and knew next to nothing of office practice. However, I carried on and stayed in Albany till July, 1878, when my friend J. T. Clarke of Boston and I sailed for England on our way to Turkey and Greece. Clarke was to write a much needed history of Doric architecture and I was to make drawings and sketches of all the temples and sites. We were each two and twenty and it looked like a pretty good world.

"We had each saved up about \$500 and Clarke made such an eloquent appeal to the Boston Society of Architects that they subscribed \$400 to our common fund. (Noble old boys, to take a chance like that!) On our way over, we figured up the expense of what we wanted to do and found we did not have money enough to carry out our plans in the usual way, so decided to buy a boat in England that we could live on; sail her across the Channel, up the Rhine, down the Danube to the Black Sea, to Constantinople and the Hellespont; cruising through the Greek islands and visiting the ancient Greek sites. All this we did! But that is another story (see "Log of the Dorian"). Among the sites visited was that of Assos in the Southern Troad opposite Mytilene, where were the remains of a large Greek city and a very early Doric temple. Clarke wrote quite a report on this to Professor Norton of Cambridge, who had

1877 *Continued*

just formed the Archaeological Institute of America, who were so interested they had the idea of exploring this or some other ancient Greek site.

"Clarke and I, after various adventures by sea and land, visiting Samothrace, Ephesus, Samos, Delos, and so on, wound up at Athens, with our little craft rather battered and our money all gone. We lived on board in Piraeus Harbor, going up to Athens every day, until a kind friend (it was Professor Norton) sent us money to get home with, and I sailed from Sicily in the steerage of a fruit steamer, reaching New York in December, 1879, stone broke, but in good health and having had a famous experience. Went to work next day for McKim, Mead and White as regular draughtsman at \$20 a week! Hooray!

"In 1880, Herter Brothers were building the W. H. Vanderbilt brownstone houses on Fifth Avenue, now part of the site of Radio City. The draughting room was in charge of Charles Atwood, who afterwards had charge of the World's Fair architecture under Burnham. There were three young architects in the Herter draughtingroom: C. Howard Walker ['99], W. A. Bates, and Clarence H. Johnston ['80]. Herter offered me quite a raise in salary, which I could not resist, so I joined the force. I found at Herter's a young fellow, Tom Hastings ['81], whose father had placed him there under Atwood to practice drawing before going to Paris. We used to help him with shades and shadows, and so on. (He came back from Paris to enter McKim's, and his later brilliant career with Carrere is known to you all.)

"We older men used to meet evenings with Walker and Bates, do little sketch problems, with perhaps a supper afterwards. Several others joined, amongst them John P. Riley, Clarence Blackall, P. P. Furber (who was superintending the Union League Club in New York for Peabody). Blackall was afterwards the first Rotch traveling scholar and is still the secretary of the Rotch Scholarship in Boston, which has given so many fine fellows the chance to study abroad. We used to meet in each other's rooms, and the host gave out the problem and kept all the sketches: a doorway, clock tower, dormer window, and so on — just a quick, two-hour sketch; and from this little club your League was born. Johnston and I had a sort of studio apartment together at 40 Irving Place. During this time the expedition to Assos was decided on and I was asked to join. I gave up my job at Herter's, and sailed for England in January, 1881. Cass Gilbert had just arrived from his first trip to Europe, before entering McKim's. He slept on my sofa, waiting to take my place with Johnston. By this time so many fellows wanted to join, they had to hire a larger room, and so the Architectural League began. . . . I used to write letters to the League from Assos and send sketches for some of the early exhibitions, so you see I have a claim to the title, 'Emeritus'! Somewhere in an early number of the *Century* magazine is an account of the first meetings of

the League. . . ." We shall continue Bacon's letter in another issue. — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1883

On September 16, the Secretary received notice of a dinner meeting at Walker Memorial for discussion of an alumni campaign for funds for M.I.T. in accordance with President Compton's program for development. The Secretary replied somewhat as follows: The active (!) members of '83 are now reduced to 12 or less. Through more than 50 years the Secretary has stimulated these and all other members to subscribe to various campaigns. None of the present members pays heavy income taxes, neither has he been obliged to organize foreign investment corporations in order to avoid them! Therefore, it seems unnecessary to appoint a committee, as suggested. Members will receive directly from the Alumni Office, or from the Institute headquarters, printed information about the need for a big fund — \$1,650,000 — as proposed, and the Secretary, as always, urges each member to read and ponder this literature, and to subscribe directly to the limit of his available means. — HARVEY S. CHASE, *Secretary*, 390 Vitoria Avenue, Winter Park, Fla.

1885

So that other Classes may read the obituaries of Bartlett, McKim, and Brown, we present here the material that was sent to our Class through the medium of the '85 *Hustler*: Charles H. Bartlett, born November 3, 1862, died February 28. At Tech he took a course in engineering, with special courses at the Lowell Engineering School. From 1889 to 1916 he was a member of the firm of Bartlett, Gay and Young, and had charge of the construction of water and sewer systems, many of them in New England. He attended the Northeastern University of Law School, and was admitted to the Massachusetts Bar in 1901. During 17 years he practiced in Boston, and later in New York. In the Spanish War and in the World War, he was active in the First Corps Cadets, Boston. His boyhood was spent in Milford, N.H.; and his last years were spent there, interesting himself in welfare work, especially among young boys.

Alexander Rice McKim, born in Jamaica Plain, April 3, 1863, died in Marblehead, Mass., July 28. Graduated from Tech as a civil engineer in 1886, he received his A.M. from Columbia University and later studied for two years at the Technische Hochschule in Berlin, Germany. He was a member of the fraternity, Burschenschaft Thuringia, and one of the Guard of Honor at the burial of Kaiser William I. He founded the Technology Club in New York City and was its president; also a member of the American Society of Civil Engineers, and of the Architectural League of New York, and at one time governor of the National Arts Club. His professional services were called upon by various private and public

commissions. Perhaps his most important work was the organization of the New York State Bureau of Docks and Dams. He wrote a code for dams which was adopted for use in New York State. He retired from that in 1927, and spent several years in Europe, studying literature, attending, in all, 12 universities.

Charles Alva Brown, born in Portland, Maine, February 1, 1863, died in Salem, Mass., September 20. He was educated in the schools of Portland and at Dr. Hickson's School in Newburyport and M.I.T. After leaving Tech he was associated with his father under the firm name of Charles D. Brown and Company, paper manufacturers and merchants. He was incapacitated some years ago and retired from active business; nevertheless at the time of his death he was vice-president of the Manufacturers Corporation and director of James Talcott, Inc., Boston. In spite of his handicap Brown attended the 50th reunion of the Class at Wellfleet in 1935 and did his part to make it a success. He attended the class luncheon in 1936 and though in failing health he attended the 1937 luncheon. We shall always remember his kindly, lovable nature, and miss him from our reunions. — ARTHUR K. HUNT, *Secretary*, 145 Longwood Avenue, Brookline, Mass.

1887

The high spot of these class notes is, of course, the narration of the events at Marblehead, Mass., on June 4, 5, and 6, attendant upon that great anniversary which marked the completion of a half century of postgraduate days. The affair was most enjoyably celebrated at the Fox and Hounds, which is delightfully located on the harbor front of that quaint and interesting old town. As a beloved classmate, now deceased, has written: "To live through boyhood's happy school days, and to survive to recall them, and to have the opportunity to tell about it is to be thrice blessed." Certainly, to have not only lived and survived those early formative days but to have the opportunity to tell of it in reunion, 50 years later, is a privilege beyond description.

Twenty-eight members of the Class were in attendance during the three-day reunion, all but two of whom were able to remain for the class dinner on Sunday night. The group consisted of Barton, Blake, H. B. Brainerd, W. H. Brainerd, Gelett Burgess, Cameron, Carter, Cole, Curtis, Squash Cushing, W. C. Cushing, Douglas, Draper, Goss, Green, Lane, Mosman, Nickels, Norris, Nutter, Schmidt, Sturges, Taintor, F. A. Thomas, W. R. Thomas, H. E. Smith, Very, and Wilcox.

The inclusion, at the reunion, of the families of members was a happy suggestion which resulted in a further augmentation by 12 wives, daughters, and in-laws, the latter consisting of a brother-in-law and a son-in-law of two of our Class, whose presence added greatly to the success and enjoyment of the occasion. The Secretary feels justified in making the assertion that future reunions of the Class will be run on the same basis.

Golf, once a stellar attraction at reunions, found but two devotees, George Draper and F. A. Thomas, who fought it out on the links of the Tedesco Club in near-by Swampscott. Scores and casualties were withheld. Much of the time which was not occupied in rocking-chair reminiscing and renewal of old acquaintances was very enjoyably spent visiting Abbott Hall, the historic Lee Mansion, and the Burying Ground. The latter spot contains many historic monuments, the principal one being that erected to the memory of Captain James Mugford by the citizens of Marblehead. Other attractions were the beautiful motor roads along the North Shore, motor trips around Marblehead Harbor and the outlying islands along the coast, as well as the historic offerings of old Salem.

On Sunday afternoon some very fine photographs were taken of groups of the Class, both with and without the ladies. These make a very attractive souvenir of what has been popularly termed the most enjoyable and successful reunion in the history of the Class. The dinner on Sunday evening was staged in the main dining room of the Fox and Hounds, with the ladies of the party enjoying themselves in a smaller adjoining dining room with a little dinner of their own, under the custody of the two husbands of the group. Gelett Burgess officiated most efficiently as toastmaster, prefacing his introductory remarks by a little anecdote for the benefit of the waitresses, which was greatly enjoyed. Letters of regret were read from absent brethren, as was also a poem written by our late classmate, Freeman M. Crosby, entitled, "Twentieth Anniversary '87," consisting of an extremely interesting and humorous narration of our 20th reunion at Chebacco Island in 1907. It was discovered among his papers after his decease.

Discussion of current matters of interest to the Class occupied considerable time, until adjournment finally brought the meeting and the three-day reunion to an official end. Monday morning those of the Class who were not provided with automobiles were transported to their hotels in Boston and thence to Cambridge by specially chartered bus of the Eastern Massachusetts Street Railway Company, an arrangement which proved very satisfactory. The participation of the Class in the class day and graduation day exercises was described in detail in the press and the July number of *The Review*. The Secretary will conclude the subject with the announcement that a copy of a photographic souvenir of the 15th reunion of the Class at Misery Island in 1902 was found at the Fox and Hounds after the reunion. The owner is sought.

The Secretary has heard from a number of the men since the reunion, all of whom were enthusiastic in their praise of the committee's choice of the location selected for the event. Sturges writes that soon after his return to Chicago he had the misfortune to slip on a rug in his home and break his left wrist. It was virtually well, however, at the time of writing: "We certainly did have a splen-

did reunion at Marblehead," he adds. Carter writes the Secretary from Chicopee Falls, Mass.: "What a grand time we had at the reunion — worth living 50 years for. What splendid copies (of the Class groups) we have all received from the committee; they were all good likenesses too. I wish we could repeat our 50th every year; it was such fun to see so many of the boys." Norris says: "Needless to say, I enjoyed my first attendance at a class reunion so much that I am looking forward to attending them in the future."

"A really memorable reunion; however, all too brief," was the opinion of Schmidt in a recent letter to the Secretary. W. R. Thomas writes: "I think the outing at Marblehead was a great success and the setting ideal. I am looking forward to the large group photograph of all of us with interest." The Secretary should state here that the large group photos taken by Mr. Pope, who came down from Technology for the purpose, were splendid examples of the photographer's art and were greatly appreciated by all, as indicated in letters recently received. The thanks of the Class are hereby extended to Lonsdale Green for his generous contribution of 100 prints of the class group, with names of all the members appended. This courtesy was greatly appreciated by everybody, especially by those whom we see but seldom and who are thereby difficult to identify. Lonsdale evidently enjoyed himself last summer despite the heat, as he writes of a three weeks' sojourn at Saugatuck on Lake Michigan, mostly spent in swimming, fishing, and accumulating a fine coat of tan. He also did some sailing and motorboating. He writes: "I rather envy you Baker's Island, for after all, the smell of the ocean is entrancing, but old Lake Michigan is a good substitute." Evidently the tang of the Marblehead ozone acquired in early June was still in evidence.

A letter from Herbert Wilcox, descriptive of his European tour last summer, is most interesting and is herewith reproduced in part. Referring to that portion of the trip between Hamburg and Trieste he says: "We had very little trouble in Russia, Germany, or elsewhere. The reports as to a number of our party not being permitted to land in Russia, no explanations being given, and the arrest of a couple for taking snapshots are correct, however. I had been warned that Germany was very fussy about what was brought in or taken out of the country and that we would be permitted to take out no German money and only United States money which we brought in. Our baggage was not inspected on entering or leaving Germany. We had to make a statement, on entering, of the amount of money we had with us, but the subject was not brought up on leaving, and apparently I could have carried out a suitcase full if I had had it. Tipping is a matter which sometimes causes unpleasantness, but we had no special trouble. I usually found out from some fellow traveler more experienced than myself, sometimes a resident of the country in which we were, what would be the proper tip,

then handed it to the one entitled to it with an air of knowing, and it would be received without comment. I employed a guide for a few hours in Naples, his fee being fixed in advance by himself. When I paid him, he demanded an additional amount equal to his stipulated fee, as a tip. I would not have minded a small tip, but his demand was so unreasonable that I refused to give him any tip whatever. We were not in France on this trip but in 1931 we found the French, particularly in Paris, very insistent in demanding tips and usually demanded more than we had given them, often being rather disagreeable about it. The Japanese were the best people we have run across, in the matter of tipping. They never *asked* for a tip, and always appeared very grateful for whatever you gave them."

Wilcox returned to California via the southern route, stopping in Washington, Atlanta, and New Orleans en route, where he visited the places of historic interest. He concludes: "Well, we had a fine trip but are glad to be back home again where we don't have to worry about catching trains and boats, or baggage transfers and such matters. . . ."

On June 7 word was received of the passing of Richard G. Schmid, who died in Chicago on that date. He had been planning up to the last minute to attend the reunion but was unable to make it. The Secretary is indebted to Lonsdale Green for the following obituary in the *Chicago Tribune*: "Richard Gustav Schmid, prominent architect, died last night in St. Luke's hospital after a week's illness. Mr. Schmid, who was 74 years old, lived at 504 Barry avenue. He was head of the company bearing his own name. Mr. Schmid's architectural career spanned more than half a century. He designed the Medinah temple at 14 East Ohio street and the Medinah Country club in Du Page county. Among others was the famous Syria Mosque in Pittsburgh. Born in Chicago, Mr. Schmid was educated here, in the Massachusetts Institute of Technology, and in Europe. He started architectural practice here in 1890. Survivors are his widow, Olivia, two sons, Richard, Jr., and Karl M., and two sisters, Mrs. Ida Randall, Evanston, and Mrs. Hedwig Komp, New York City."

Changes of addresses of classmates, in addition to that of the Secretary, are as follows: William B. Blake, 2836 Sixth Avenue, North, St. Petersburg, Fla.; William D. Sargent, 3756 Pine Tree Drive, Miami Beach, Fla.; Charles E. Bockus, Clinchfield Coal Corporation, 75 West Street, New York City. — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

George W. Roper, civil engineer, railroad constructor, and shipbuilder of Norfolk, Va., wrote your Secretary from Charmian, Pa., inclosing a photograph of a cabinet of Pennsylvanian chestnut wood with most wonderful hand carvings made by him. The designs on the panels are blue herons standing in a marsh and also circling in flight, at top center a fig-

1888 Continued

ure of an Egyptian goddess, and at bottom an eagle with wings extended. Roper says that he does this work while on vacation in the mountains "when there is nothing else I prefer to do at the time, as it affords relaxation." Our champion mile runner should need a little relaxation at this time of life. Roper states that he is enlarging his shop to admit use of power tools in order to give more time for carving. He has also made improvements in Mrs. Roper's studio. We understand she is an artist of unusual ability.

Classmates seem to be taking up the travel habit: Runkle spent the summer on an island off the coast of British Columbia; Conner passed the summer in Europe; Merrell was in California for two months; Nichols returned from Florida to Chicago, breaking the journey by a month's golfing at Columbiana, Ohio.

Thompson inquires about your Secretary's case of poison ivy, and he is glad to report that it is all cured, and that he retaliated on the Chebeague Golf Course by making a score of 76 for 18 holes, breaking his record of ten years' standing. — Frank Moore, our class golf champion, intimates that Rockport might be a good place for our Glorious 50th next June, improving if possible, on our 45th which was held there.

Before you read this, we hope that our royal entertainer, Ned Webster, will have been elected president of the Class to fill the vacancy left by our lamented Alfred Sawyer. Nineteen letters received by the Secretary all pointed in that direction. Your Secretary is spending the winter with Mrs. Collins in Norfolk, Va., and is enjoying its salubrious climate. — BERTRAND R. T. COLLINS, *Secretary*, 407 Warren Crescent, Norfolk, Va.

1889

One of the pleasantest affairs which has ever come the way of '89 men was the luncheon tendered the Class by Welles Bosworth. Welles has been living in Paris for several years, engaged in caring for the restorations of the Palace of Versailles and the Cathedral of Reims, which have been made possible by the generosity of the Rockefeller family. His visit here was in connection with the plans for the new M.I.T. Architecture Building, of which he is the designer, and his desire to meet the boys was the occasion of this gracious gesture. The time was 12:45 p.m. of July 14; the place was the pleasant second-floor dining room of the St. Botolph Club; and those present, beginning with the host and reading in a general way around the table to the right (but not accurately in order because, after all, the Secretary has his lapses, and the wine was particularly good that day), were Bosworth, Kilham, Bliss, Wales, Lewis, Gleason, Marsh, Pearson, Manning, Fiske, Sauveur, Cutter, Hunt, Bridges, Gilbert, Kinsman, Hobbs, E. V. French, L. E. Johnson, Hart — 20 men in all. Bosworth was prevailed upon to give a very short description of his work in France and of his project for the Architecture Building, but the party broke up at an early hour. In passing, the

Secretary thinks it worth while to say that the delicious luncheon itself showed the influence of a mind accustomed to the delicacy and discretion of the best French cuisine. Welles brought his charming French wife and two young daughters along on the trip, but they were not present at the luncheon.

Juddy and Mrs. Wales, after 31 years in their old abode, have now moved around the corner to 40 Carlton Street, Brookline. A dinner service of 12 plates from original designs by Juddy has been announced by Alexander Crane of the State Street Trust Company of Boston. The subjects are famous American clipper ships from Juddy's drawings. Mr. Crane can furnish full information.

The *Textile Age* for July contains a life-like portrait of Frank Hobbs and an account of his work, of which the following is an abridgment: "Success in any industrial enterprise consists of many elements, and the record of Arlington Mills, of Lawrence, Mass. — from a small wooden mill, 135' long by 35' wide and three stories high, with a capital stock of \$200,000 in 1865, to a vast industry in 1937, occupying twenty-two large brick buildings covering a floor space of 54 acres, with a net worth in excess of \$12,000,000 — is ample proof that no element of success has been lacking here. The entire property, in both Lawrence and Methuen, covers 56 acres. Arlington Mills have often been spoken of as 'typical' of the most modern development in American textile manufacture. The worsted department manufactures worsted top, yarns and dress goods, and the cotton division makes mercerized and bleached cotton yarns. The worsted combing mill can handle 550,000 pounds of top per week, which is equivalent to the fleeces of 40,000 sheep per day. The worsted spinning mill produces 200,000 pounds of worsted yarn per week, a part of which is shipped to weavers and knitters of fine worsted goods in various parts of the country, with the balance being used in the 1,350 looms operated in the production of women's wear, dress goods, coatings, plain and fancy men's wear, and specialties. Executive offices of Arlington Mills are located at 78 Chauncy Street, Boston, Mass. Officials of the corporation are: Franklin W. Hobbs, President; Marland C. Hobbs, Vice-President; Albert H. Chamberlain, Treasurer; Harry A. Wright, Clerk; John T. Mercer, Resident Agent at Lawrence; and J. Sime Mercer, Assistant Agent.

"The seventy-two year history of Arlington Mills reveals one fact of major importance — that since 1869 the development has been in accordance with a single well-conceived, progressive, far-sighted policy, strictly adhered to. The present executive management has attributed this success, in considerable measure, to the great personal services of the late William Whitman, Sr. These great services accrued, in addition, to the benefit of the entire worsted industry in the United States. As Mr. Whitman gradually withdrew from the direct management of the Mills, Franklin W. Hobbs,

who has been with the corporation since 1891, progressively assumed the responsibilities of assistant treasurer, treasurer, and president, holding the latter post since Mr. Whitman's retirement in 1913. Mr. Hobbs has guided the destinies of Arlington Mills with an understanding and knowledge gained during 46 years' association with its problems and growth, which have given the corporation the inestimable advantage of that continuing and increasing momentum that can come only from an extended period of uninterrupted and determined effort. An immensely interesting fact in the history of this organization is that during its entire 72 years of existence only two presidents have been at the helm — Mr. Whitman, Sr., and Mr. Hobbs. Marland C. Hobbs, son of the president, entered the employ of Arlington Mills in September, 1919, on his return from army service in the World War. Mr. Hobbs began in the combing room and worked his way through to the vice-presidency. He is an important force in the business today."

The Secretary has received from Tug Wilson, whose address is 810 Broadway, Nashville, Tenn., a copy of his book, "The Parthenon of Pericles and Its Reproduction in America." The subject matter of the book relates to the beautiful full-sized reproduction of the Parthenon at Athens, which has been built in Nashville. This reproduction, constructed of enduring materials, replaces the lath and plaster Parthenon which was built for the Tennessee Centennial Exposition of 1897. Expected to last for a year, it actually stood for 24 years. The research which was necessary to make the new Parthenon a perfect reproduction of the original required 11 years. The building finds its greatest use through the influence of its beauty upon the public mind, but it also has a supplementary purpose as a gallery of art. Wilson is now its director. The book is handsomely printed and well illustrated and contains, besides its description of the Nashville replica, an interesting discussion of the history and other matters concerning the original Parthenon at Athens.

The Secretary has received the following interesting note from Henry Howard: ". . . We had a most interesting week in Berlin at the meeting of the International Chamber of Commerce, which I attended as a delegate from the United States Chamber of Commerce. The meeting was attended by representatives of over 40 countries, and of course the German Government did everything they possibly could to make our visit a pleasant and interesting one. As usual, many resolutions were passed, but I am very skeptical as to whether any of them will bear much fruit. I believe, however, that such meetings are well worth while because of the personal contacts that are established and friendships that are made in this manner between more or less representative people of each country.

"The condition in Germany appears, on the surface, to be distinctly better than it was when I was there two years ago, in

1889 Continued

that practically everyone is now employed. On the whole, I think the people you saw on the street look happier and better dressed. It should be remembered, however, that a large part of the employment today comes from two sources which cannot last indefinitely: first, the intensive rearmament program which is employing many men in the building of a new navy and war equipment and supplies of every nature; second, a large number of men have been employed in building an enormous number of houses for working people. Of course these programs cannot be continued indefinitely, and a good many people in Germany are worrying as to what will happen when these sources of employment have to be curtailed. Mr. Schacht has accomplished wonders in the way of pushing German exports, through bartering agreements with a large number of countries, and if trade barriers throughout the world are lowered or removed to any extent, this would of course solve Germany's problem. The tax on the Lutheran and Catholic churches seems to have had the effect of reviving interest in religious matters. I understand that the churches which were formerly very empty are now crowded to overflowing with congregations.

"I do not believe that either the German people or anyone within the German government want war at present. I think they all feel that the only thing that can restore Germany to any degree of permanent prosperity is a long-continued peace. Their rearmament program has been more or less the direct result of the military alliance between their two enemies, France and Russia. Next month I am expecting to attend the meeting of the Joint-Canadian-American Committee of which I have been a member since its creation about five years ago. The meeting this year will be held in Banff. The Committee is a joint committee appointed, respectively, by the United States Chamber of Commerce and the Canadian Chamber of Commerce for the purpose of preserving and promoting friendly relations between the United States and Canada. Our meetings have been very interesting and, I believe, productive of much good."

George Stone has been sojourning among the agaves and yuccas in the shadow of Popocatepetl. Following is part of a letter dated in Mexico City: "Don't be seriously shocked at receiving a letter from me. I've been here since July 15 and have no definite time set yet for my return to Washington. I am visiting my son, who is with the General Motors of Mexico, their headquarters being in this city. I know you visited this country once and you may have been here several times. I like it very much, especially the climate of this plateau, which suits me to a 'T,' whatever a 'T' is. I can't say that I've seen much of Mexico except this city and some of the nearer towns. Cuernavaca, Taxco, Puebla, Toluca, and so on, and, of course, the pyramids and many churches and Rivera and Orozco frescoes. Rivera's home is not far from here and is modern as to design, and probably as to plan, to the *n*th degree. I attempted some sketches

last summer but didn't progress far or very well. Don't know whether I can ever pick it up again or not.

"I haven't been around at all this trip, other than the motor trip from Vera Cruz to here, the reason being a small granddaughter who keeps me more than busy. How did Bosworth's dinner turn out? I was sorry I couldn't be there, but I hope the first copy of *The Review* this fall will carry a reportorial account written in your fine literary style. I look for '89 news in each copy but lately haven't found much — no fault of yours I know. I keep somewhat in touch with Tech by attending the monthly lunches of the association in Washington; the majority of those present are, however, terribly young. I enjoy them, though. This land is full of tourists, Americans; you meet them everywhere. There were 350 on the boat I came on in July. If I don't see you before, I hope to see you in 1939."

Charley Borden died on June 3. The following account of his life is from the Fall River *Herald News* of June 4: "Charles N. Borden, 511 Rock Street, active in the textile and banking fields here for years and former treasurer of the Richard Borden Manufacturing Company, from 1906 to 1930, died last night at the Phillips House, Massachusetts General Hospital, where he underwent an operation, Saturday. He was born, Dec. 17, 1867. Mr. Borden, a native of this city and son of the late Richard B. and the late Mrs. Ellen (Plumer) Borden, retired from active work in the textile field in 1930. He was a member of the Board of Directors of the Richard Borden Manufacturing Company, which was founded by his family, and of the Fall River National Bank. He was a director of the Fall River Manufacturers Mutual Insurance Co. He was a trustee and chairman of the auditing committee of the Fall River Five Cents Savings Bank, a member of the Quequechan Club and attended the Central Congregational Church. He was a graduate of the Fall River High School and of Massachusetts Institute of Technology with the Class of 1889. He was a member of the Massachusetts Naval Militia, serving as ensign in the Signal Corps on the Coast of Maine and later as ordnance officer on the Monitor Lehigh at Charlestown during the Spanish-American War. Surviving him are his wife; a daughter, Mary; a brother, Richard P. Borden; a sister, Mrs. Clifford M. Gardner; and a niece, Mrs. Maxwell Turner, all of this city."

News has been received of the death of Harry D. Smith of Detroit on July 17. The Secretary has no particulars. — The Secretary has learned of the death of Elbridge R. Conant on September 24. The following account of his career is from the Boston *Evening Transcript*: "Funeral services for Elbridge R. Conant, former president of the National Society of Municipal Engineers and first city manager of Savannah, Ga., who died yesterday at Robinson Memorial Hospital, will be today at 4 p.m., in his home, 29 Douglas Road, Belmont. Rev. Elmer N. Owen of All Saints' Episcopal Church,

Belmont, will officiate. Burial will be in Woodlawn Cemetery in Acton. Mr. Conant was born in Acton seventy-two years ago, a son of Luther and Celeste J. (Robbins) Conant. After being graduated from the Massachusetts Institute of Technology in 1889, he went South where he spent twenty-one years in outstanding river and harbor work. He was associated with the United States Engineering Corps. He was appointed city engineer and city manager of Savannah, Ga., in 1914. Mr. Conant returned North, about twenty years ago, living most of the time since in Belmont. He was a member of Landrum Lodge of Masons of Savannah and of the American Society of Civil Engineers. Mr. Conant also was past commander of the Knights Templars."

The Secretary has learned also of the death of John W. Case on September 10 in Utica, Mich. The following is from a newspaper clipping: "John W. Case, seventy-three, nationally known architect of Utica, died last night at his fishing camp on the Au Sable River. He was born in 1864 in Geneva, O. After studying at the University of Michigan, he majored in architecture at Massachusetts Institute of Technology and later studied in Europe. His career as an architect took him to New York, Boston, Baltimore and Detroit. He was professor of architecture at the University of Illinois from 1905 to 1920 when he returned to Michigan."

The Secretary has received the following letter from O. W. Pickering whose address is now 720 Haven Street, Ann Arbor, Mich.: "In case any of the boys should care to know more concerning my career of crime, here goes for my confession, which I hereby and hereon assert to be of my own free will and not extorted by third (3d) degree methods. First — I got married a long time ago and have one wife and two sons. The older one graduated from Course I, M.I.T. '15, while the younger one graduated from the University of Michigan in 1932 and has been doing editorial work on the Detroit *Free Press* ever since. We came to Ann Arbor in 1923 and bought (?) a lot of valuable (?) real estate and for the last eight years have spent our waking hours trying to dodge the sheriff. I read the papers every day and eagerly devour all the stories about prosperity, but none of it has shown up yet on my street. You may wonder about this curious letterhead; it was printed without my knowledge or consent by Mr. Rice, who brought me a bunch with the information that he and I were going to get rich. He has not explained how as yet, but I have reached the stage where I don't care anything about the how so long as I am not obliged to ruin my reputation by dodging income taxes. Sorry I can't be with you, but Wednesday noon I will eat some B and M brown bread and baked beans and think about 'you all' while I lap up a mug of suds and hope you have the best lunch since 1889."

From the *Engineering News-Record* of March 11, the Secretary has learned the following: "William M. Beaman, chief

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of inspection and editing of the Topographic Branch of the U. S. Geological Survey, died in Washington at the age of 69. Mr. Beaman was the inventor of the Beaman arc, used on telescopic alidades and was author of the chapter on topographic mapping in the book, 'Topographic Instructions,' issued by the U.S.G.S. He entered the Geological Survey immediately after his graduation in 1889 from Massachusetts Institute of Technology, rising from the rank of topographic aid to his late position which he attained in 1922. During the war he served with the U. S. Engineers with the rank of Major, reporting to the U.S.G.S. as inspector of topography for surveys made for the War Department." — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

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Alumni Day brought back to M.I.T. Burley, Carney, Crane, Goodwin, Kendall, Mann, Packard, Roots, and Sherman. Kendall was elected chairman of the brief meeting held before the dinner and, following the plan of the notice sent out, Packard was elected secretary and Goodwin assistant secretary. This plan seemed to have general approval, as expressed in letters received from those who sent regrets that they could not be present: Miss Rogers, De Lancey, Lenfest, LeSueur, Noyes, Waite, and White. A little time was given to the discussion as to whether we should get out a class book for our 50th, briefly relating what each member of the Class has done. While the idea met with general approval no definite plan was adopted.

News of the death of Leonard C. Wason came too late for our last notes in *The Review*, but it was mentioned in the '91 notes in July. Most of us remember especially his athletic prowess; many cups he had won adorned his mantel in later days. As head of the Aberthaw Company, he early amassed such detailed cost information, that, combined with his reputation for dependability and square dealing, the company was able to secure much desirable business on a cost-plus basis.

The following resolutions were adopted by the Alumni Council: "We mourn tonight the loss of Leonard Chase Wason, representative at large on the Alumni Council. Making early use of his Technology training in engineering fundamentals, he joined in forming, in 1894, and in 1895 became president of, the Aberthaw Company which pioneered in the introduction of reinforced concrete, developing and applying its uses in numerous buildings, mills, residences, and other structures, including the Harvard Stadium, the Squantum Destroyer Plant, the Christian Science Publishing Building.

"Always helpful with kindly counsel, he was the author of the 'Engineer's Handbook of Reinforced Concrete,' and a contributor to the technical press. President of the American Concrete Institute, he established the Wason Award for Research on Concrete, and also the Wason

Medal for the most meritorious paper presented annually. For meritorious achievement he received, in 1929, the Fowler Prize of the American Society of Civil Engineers. As chairman of the committee which developed the 'Code of Practice' of the American Society of Civil Engineers, and as one of the organizers, vice-president, and branch president of the Associated General Contractors of America, he aided in the establishment of ethical standards; and as a member of the Brookline Town Advisory Board, Planning Board, and Board of Appeals, he was helpful in his community. . . ."

Also occurring too late for mention in our last notes was the death of Austin D. Boss in Willimantic, Conn., May 10, after returning from a winter in Florida. The following is abstracted from the *Willimantic News* of that date: After graduating from the Institute, he was, for three and a half years, an engineer in and about Boston, teaching at the Institute for one year. In 1894 he was appointed manager of the Morgan Street plant of the Willimantic Linen Company in Hartford, and when the American Thread Company took the business over in 1898, he became superintendent of finishing and assistant agent. Later he became agent, resigning in 1919. "Active in civic affairs and community welfare work, his philanthropic activities throughout the city among all classes were innumerable."

Wallace MacGregor, who specialized in chemistry and metallurgy with us for four years, passed on in Yreka, Calif., September 19. Taken with appendicitis at Happy Camp, where he was building a mill, the appendix burst before he could reach a hospital. On leaving Tech MacGregor went to Arizona, where for several years he had charge of a small mill and smelter for the Phelps Dodge Corporation. He left to erect and operate gold leaching plants elsewhere in Arizona and, later, in California, where he leased and worked a tailings pile very successfully in Plumas County. Following this he planned and erected two gold mills in Central America and then, from 1906 to 1911, had charge of plant operations for a French company in the Goldfield district of Nevada. Later he designed and operated other mills in the West and acted as consulting engineer and metallurgist. He was especially well informed on all types of gold milling. While working in Plumas County, he designed a special type of nozzle or monitor to protect his plant from forest fires. This he later developed, patented and manufactured, and it is now used by the fire departments of several large cities.

Absolutely honest and dependable, a hard worker, with a good sense of humor, MacGregor retained the friends and clients of his early years. In 1900 he established his home in Berkeley, Calif., where he is survived by his wife and son. A daughter is the wife of Albert L. Edson '21 of the Boston Airport.

The death of Francis H. Kendall on October 7 brought to a close a life of disinterested public service such as is seldom

equaled. Modest and somewhat reticent, he was known to comparatively few people outside his town and those who came in contact with him in connection with county affairs. There was nothing spectacular about him, but those who knew him put implicit confidence in his integrity, his fair-mindedness, his sound judgment, and his willingness to give unstintingly for the general welfare. Kendall was born in Belmont, Mass., August 23, 1869, and that was his home throughout his life. After graduation from the local high school, he attended the Case School of Applied Science for three years and transferred to M.I.T. in 1888, graduating with our Class. During the next year he was assistant to the professor of railroad engineering, and then for about a year and a half was an assistant engineer on the Cleveland, Cincinnati, Chicago, and St. Louis Railway. In 1892 he entered the office of the county engineer of Middlesex County, and in 1894 he became county engineer, a position which he held for the remainder of his life. He was a member of the American Society of Civil Engineers, the Boston Society of Civil Engineers, and the Massachusetts Highway Association.

In Belmont, Kendall served as water commissioner for 12 years, selectman for six years, a member of the Warrant Committee (the town's budget committee) for many years, and on a large number of special committees. He had been a trustee of the Belmont Savings Bank since 1905 and its president since 1922. He was also a director of the Waverley Coöperative Bank for many years. He was a member of Belmont Lodge and Beaver Lodge of Masons, and was treasurer of the latter. He was affiliated with the First Church in Belmont (Unitarian). He was married in 1900 to Lilly Miller '92, who survives him.

Cyrus Cates Babb died at Granite Falls, S.C., October 2. In his early days he was a hydrographer with the United States Geological Survey, making headquarters at Washington. From this it was a natural step to the United States Reclamation Service, spending part of his time at Washington and part in the field as project engineer. In 1909 he became chief engineer of the Maine State Water Storage Commission, and during this period was president for one year of the Maine Association of Engineers. Since 1915 he had been in general engineering practice in North and South Carolina, acting as consulting engineer for several large power companies. Since 1928 he had been senior hydraulic engineer of the United States Corps of Engineers and consulting engineer for the Natural Resources Commission. He was a member of the American Society of Civil Engineers and of the American Geophysical Union.

Notice of the death of Charles Neave has just been received by the Secretary and further notes on his life work will appear later. — The notice of the '90 meeting sent out brought word of the death of William H. Johnson on December 17, 1935. He was with us only during the freshman year.

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Charles R. Nason recently celebrated his 50th anniversary as a member of the actuarial department of the Aetna Life Insurance Company at Hartford. — Daragh de Lancey, noble soul that he is, writes that he tries to be cheerful though condemned to "a life of semi-invalidism, with quite limited activities," nurses, oxygen tent, and so on. — The firm of Lois L. Howe, who by the way is the only woman fellow of the American Institute of Architects, had a much noted showing at the exhibition of the building arts in Boston.

The address of Samuel Storrow has been changed to 1730 Oak Grove Avenue, Pasadena, Calif. — H. M. Waite is now at Quoddy Village, Eastport, Maine, with the National Youth Administration. — Henry H. Pope, who is at 434 North Oak Park Avenue, Oak Park, Ill., dropped in on July 15 and expressed his regret that illness prevented his coming to the reunion. He looked natural, and has put on no excess weight, though he has been in the hospital twice. He gets east rarely but is looking forward to our 50th. — Many of us remember the attractive youngster Swanton brought to a reunion a few years ago. He reports that she now has a scholarship at Oberlin College after graduating at the head of a class of 450 and being editor-in-chief of the class yearbook. — Charles Sherman has been elected to fill out Kendall's term as president of the Belmont Savings Bank. — Packard is one of the Executive Committee of the M.I.T. Council this year and member of the Course III Visiting Committee. — GEORGE A. PACKARD, Secretary, 50 Congress Street, Boston, Mass. HARRY M. GOODWIN, Assistant Secretary, Room 4-112, M.I.T., Cambridge, Mass.

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Our classmate Alexander G. McKenna passed on at St. Luke Hospital, Pasadena, Calif., on July 29 after several weeks' illness. He was graduated from Course V, and those of us who took chemistry or chemical engineering will remember him as studious and efficient, the type of man who is likely to succeed. While we seem to have lost contact with him over the years, his generous contributions to Technology and class activities showed his continued interest. Your Secretary and George Hooper had planned to visit him last June, but lack of time prevented, and he must have been in the hospital close by George's home.

The following is from a local newspaper and outlines his unusually active career: "Alexander G. McKenna, 72 years old, was chairman of the board of directors of Pomona Pump Co., Pomona, Cal., and a leading industrialist, having been engaged in manufacturing for more than half a century. Mr. McKenna had been active in the pump company business here until last June and, during his long residence in Claremont, had shown a keen interest in the educational institutions there. It was in 1923 that Mr. McKenna and his son, G. A. McKenna, purchased the Pomona Pump Co. plant.

In December, 1924, the McKennas assumed active management of the company, A. G. McKenna's affiliation with the firm having been of special significance because he had been identified with the steel industry since 1887, and had been responsible for the introduction of many new processes.

"Mr. McKenna, at the age of 15, went to work in the shop of his father, the A. and T. McKenna company. When 19 years old he learned the art of metal spinning at Philadelphia, which he then introduced into the McKenna company plant with great success. During college vacations he worked at the Homestead and Edgar Thompson Steel works, and upon graduation, in 1891, went into the laboratory of the latter company. When the Carnegie Steel company began the manufacture of pig iron at its Duquesne plant, Mr. McKenna was transferred there from the Edgar Thompson company. In 1897 he went to the Firth-Sterling Steel Co., Pittsburgh, as metallurgical superintendent. In this capacity he introduced many new methods in crucible steel production and also in new alloy steels. Under his supervision the tool steel and projectile business grew to such proportions that it became necessary to expand. This resulted, in 1907, in the organization of the Washington Steel and Ordnance company, the corporation remaining in control of the Firth-Sterling syndicate of England. In 1910, he organized the Vanadium Alloy Steel company, of Latrobe, Pa., which later went under management of Roy McKenna, a brother and member of the McKenna syndicate.

"A year later Mr. McKenna organized the Latrobe Tool company for the manufacture of the well-known brand of twist drills for iron and steel work. This company came to be known as one of the largest manufacturers of high-speed drills in the world. In 1913 he organized the Latrobe Electric Steel company, which has manufactured most of the high-speed tool steel used by the Ford Motor company for many years. In 1914, Mr. McKenna organized the Chemical Products company, of Washington, D.C., to manufacture, under a process invented by himself, a tungsten powder for low-grade ore. This company was later absorbed by the Federal Tungsten company, Washington, with the McKenna syndicate operating it. Mr. McKenna also took the lead in various other enterprises the syndicate controlled.

"The McKennas brought capital, organizing ability and technical skill to Pomona. As they assumed active management of the Pomona Pump Co., engineering and manufacturing departments were promptly reorganized, and experimental work started under direction of Mr. McKenna quickly resulted in improvement in design and efficiency of the product. Mr. McKenna spoke little of his accomplishments. He would rather tell an interviewer of the wonders of Pomona college or any of the affiliated institutions at Claremont, of the magnificent orange groves or of his desire to see young men gain the proper viewpoint of science in

the relation to industry. Achievement was his ideal. Of a highly scientific mind, his activities centered about his accomplishments as a chemist and metallurgist. He had done lecture work in the California Institute of Technology and in higher mathematics at Pomona college under the Harvard exchange professorship. He had at times coached college students in mathematics or other subjects, in his own library. He led a simple life and enjoyed associations with students as well as members of his own family.

"Mr. McKenna was born in Allegheny, Pa., February 11, 1865, of Scotch ancestry. Surviving are his widow, Mrs. Eliza M. McKenna, Claremont; three sons, George A. and Donald C. McKenna, both of Claremont, and Philip H. McKenna, Latrobe, Pa.; a daughter, Mrs. Anna Pavaroff, Hollywood; 10 grandchildren, five brothers, and a sister.

William C. Hawley died at his home in Taunton, Mass., on August 16. The following is from a local newspaper: "William Church Hawley, 27 Harrison Avenue, Taunton, son of the late deputy state auditor and Mrs. William D. Hawley, passed away this morning at his home after a brief illness. He is survived by a sister, Miss Celia Hawley of Clifton St., and a brother, Jack Hawley of Washington. Mr. Hawley was born near Washington and had been in the State Dept. of Public Works since 1888. He would have been 70 on April 16th and was to retire then. He was last at the State house on Thursday of last week. His latest duties in the department were in charge of state, city and town boundaries. He was rated as an assistant engineer. Death was due to a heart ailment. His wife, a son and two daughters survive besides his sister and brother."

Since our last Review notes, four of us (perhaps more) have trekked to the Pacific Coast with our wives. Howard and Mrs. Forbes went recently and we have not heard from them, except a postal from Charlie Garrison which mentions seeing them. Fred and Mrs. Blanchard made an extensive two months' tour in June and July, and your Secretary and Mrs. Fiske a six weeks' trip of combined business and pleasure at about the same time. Our paths crossed (or came together) at three different times, of which more anon. Birks was in Los Angeles but we have no information about his trip.

The Fiskes went direct to Los Angeles by train (no motorcars or airplanes for us, thank you) and from there to San Francisco, Portland, Seattle, taking in Glacier and Yellowstone parks on the way back. We perhaps enjoyed Los Angeles the most because of many friends and our interest in the moving picture business — Mrs. Fiske's woman's club and D.A.R. work with movies, and mine from the fire protection viewpoint. (It would hardly be proper for me to express any special interest in movie stars.) My visits to the studios were confined to Warner and Fox where we have done considerable work, while Mrs. Fiske visited and was entertained at several others. It was all most interesting from any point of view,

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the business end a crazy patchwork to which no other business seems comparable, with unusual personalities holding the patchwork together.

The plants are enormous, with numerous wooden shells of buildings, called studios, where sets are made up, several in a building. One of the most elaborate and more permanent was an ice rink for Sonja Heine, which took up all of one studio. They put milk in the water to prevent glare. At a luncheon at Fox's, that young lady, with friends, was at the next table, Jane Withers at another, and other stars of both sexes. This luncheon building is elaborately decorated with frescoes, paintings, and what have you. The amount of time and patience in making shots must be seen to be appreciated — the same thing over and over — and it was stated that a good day's work for a director is represented by from one to two minutes on the screen.

We visited George Hooper, who has a most attractive home in Pasadena, and he motored us about and took us to the Huntington Museum and California Tech, where we saw men grinding the 200-inch telescope lens. George and Mrs. Hooper gave us a dinner party at their home, with Bert and Mrs. Kimball as overnight guests. Both daughters were there, also the husband of one (see elsewhere about the other daughter). — Arthur Alley and his sister were at our hotel one evening, but they were with friends. I had a chat with Arthur, and he was looking fine — showed the good effects of outdoor life. We had several motor trips with other friends, and visited the farm where lions are raised, trained, and sold. The price was rather high for souvenirs. — As all who have been there know, Hollywood with its famous Chinese theater and restaurants, Beverly Hills with its movie star mansions, Santa Monica with its beach clubs, San Pedro with its harbor and fleet of 20 or more battleships, and so on, Long Beach, where Charlie Garrison used to live, Rodondo Beach, where Bert Kimball now lives, are all most interesting. We were very sorry to miss the Garrison family but Charlie was on his Alaskan trip.

At San Francisco, the bridges, now completed, and the World's Fair, now under way on an artificial island, are objects of pride. Our plant there was shut on account of strike (reason unknown) but opened while we were there. All the big hotels were closed on strike but we stopped at the Canterbury, one of the smaller hotels, which was very nice. I had lunch with Leland; he is engineer in charge of mechanical equipment at the Fair and looks fine, younger than his years. The University of California was closed, so we did not see Hersam. Going in to dinner one night at our hotel we found the Blanchards, and the ladies spent a day together. — At Portland, Ore., we visited friends who drove us up the Columbia Highway to Hood and back on the Washington State side. Incidentally, is there anything which excels in scenic beauty those snow-capped

mountains — Rainier, Hood, and Shasta, which latter we saw by moonlight? Perhaps next to that are the many and beautiful falls along the Columbia Highway. At the Mulnomah Hotel we again ran into the Blanchards and checked up on each other. — Seattle is a modern and attractive city with its many hills, Puget Sound on one side, and Lake Washington on the other. If you visit Seattle, don't fail to take the boat ride, covering sound, canal, and lake. It would be hopeless to try to describe the parks. Glacier is beautifully scenic, with its lovely lakes and snow-capped mountains, its glaciers and waterfalls. Yellowstone is nature's wonderland, and Old Faithful Geyser alone is worth the price of admission.

Fred Blanchard has the following to say about his trip: "Mrs. Blanchard and I left Boston, May 29. Stopped first in Chicago and then on to Denver on the new Diesel streamline *City of Denver*. Wonderfully modern equipment, average speed 65 miles per hour and, in the last half of the thousand-mile run, gained 4,000 feet in altitude. In Denver called up Frank Shepard '87, an old boyhood friend. Next, to Colorado Springs where I went up Pikes Peak to be lost in a cloud, nearly frozen and my wind gone. A wonderful automobile road, gaining 10,000 feet in a few miles. Took the Royal Gorge route from Colorado Springs to Salt Lake City. How they ever raised enough money and had the engineering skill and perseverance to put that road through is beyond my comprehension. Sometimes the locomotive was almost looking into the observation car. Part of the track is suspended over the river, being supported on brackets built out from the canyon wall.

"At Salt Lake was impressed by the immense open mine of the Utah Copper Company, where they blast, shovel, and haul out 60,000 tons of ore in a 24-hour day. Between shifts they do the blasting and it sounds like an artillery engagement. We next took the Union Pacific trip to Bryce, Grand, and Zion canyons. For color and nature's architecture, there 'ain't no such animal.' At the canyon lodges all the help are college boys and girls. They not only do the work but have their own orchestras, put on shows, and have a dance every night, greatly to their enjoyment as well as the guests'. Visited Boulder Dam and then on to Los Angeles, our main objective, where our son and his family have resided for about four years. We had the great pleasure of dining with George Hooper and his charming wife in Pasadena, and with Arthur Alley and his sister in La Jolla. Miss Alley is as fine as Arthur, and no more praise can be bestowed. We missed Charlie Garrison in Santa Barbara, by one day.

"Up the coast to San Francisco by daylight was certainly a scenic trip. There Mrs. Blanchard spent most of her time hunting bargains in the very intriguing Chinese shops, accompanied by Mrs. Henry Fiske. Had a nice visit with William Leland, whose firm is engineering the coming exposition. Next stop at Portland, Ore., where we took the Co-

lumbia River and Mount Hood trip. Beautiful country, more like New England, miles and miles of wild rhododendrons in full bloom. From Seattle, where we visited friends, we took the Canadian Pacific Railroad steamer through Puget Sound to Victoria, B.C. This trip was a strong reminder of the coast of Maine but on a grander scale, with snow-capped mountains for a background. At Victoria we greatly enjoyed the Empress Hotel, operated by C.P.R., and Mrs. Blanchard was enthralled by the Butchart Gardens. We never saw any such display of flowers and shrubs, and it was all beautifully landscaped. Continuing on the C.P.R. steamer to Vancouver we had a beautiful five hours' trip, all inland waters, narrow passages between islands, rocky and wooded shores, mountains in the background and air 'like old wine.'

"Our next stop was at Lake Louise, certainly a gem in a mountainous setting; then to Banff, where I had two games of golf on the most wonderful course I ever saw. It runs along a tumbling river, is closely hemmed in by the mountains, and the course itself is of very high quality. After three days on the C.P.R. we arrived in Toronto and took a steamer through the Thousand Islands and Lachine Rapids to Montreal, a very beautiful and somewhat exciting trip. Was quite impressed by the canal system for overcoming the rapids. As we looked through the trees on the river bank, we could see great steamers apparently ploughing through the meadows. From Montreal we took the Saguenay River trip, up and back to Quebec, then after a few days in Montreal we arrived home, July 15. Called on Birks in Montreal and was sorry to miss him."

Some postals came from Charlie Garrison, telling of his trip north to Vancouver by auto and then to Alaska by boat. On the way north he visited the Mariposa Grove, Sequoia Park, the Yosemite, Sacramento, the Redwood State Parks, Oregon, Washington, and Victoria. The boat trip was to Skagway, with numerous stops. Barney thinks Charles wrote him about this trip, but the letters were mislaid. We know he got back safely and enjoyed the trip. — Gorham Dana had his usual pleasant summer at Lake Sunapee. Frank Holmes was at Kearsarge, N.H., and reports Fred and Mrs. Wilson there also. The George Holmes family were at Boothbay Harbor, Maine; Harry Bradlee and family at Mount Washington Hotel, Bretton Woods, N.H., and so on.

We received a letter from John Putnam, inclosing a picture of him and two grandchildren. His wife has not been well; we hope she is much better by the time you read this. His daughter Priscilla lives at West Dennis on the Cape, and Mrs. Putnam was there this summer. — Mrs. Aiken ran the Aiken Manor House at Webster Lake, N.H., and had a good season, as did Dorothy Aiken Johnson and her teahouse and log cabins near by.

Harry and Mrs. Young have been abroad this summer, as has Steve Bowen. Harry wrote from Copenhagen that Steve

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came from Sweden to see them there: "Mrs. Young and I came over to France on the *Queen Mary* (a floating palace) and spent two weeks in Paris and a day in Tours, to call on a French lady, and two days at the American cemetery at Romagne, up in the Argonne. There are now completed seven American cemeteries, and they are very beautiful and kept in perfect order. Each has its memorial chapel with the names of all the missing men cut in the walls. The war monuments are now also finished and are to be dedicated in August beginning with the one at Montfaucon on August 1. General Pershing will be there and the President of France and the governor of the Meuse-Argonne district, and it is to be quite an event, with the speeches going over the radio, and President Roosevelt is to give a five-minute response from Washington. A week later the monument at Mont Sec in the San Mihiel sector will be dedicated and then the monument for Château Thierry. They will also unveil an equestrian statue of General Pershing at Versailles. So we are doing a lot of celebrating in August.

"In Paris everybody seems to be on a strike — restaurants closed up and soldiers parading in front of hotels day and night. The Exposition supposed to be finished on May 1 is still about half built. — Russia and Germany finished theirs. England had to send over her own carpenters to finish hers and loaned them to the United States to finish our building which is not yet open. — Have been in Cologne and Hamburg and can say that Germany seems contented and prosperous; anyway, everyone seems to be working or playing. Playgrounds are in evidence everywhere. — Denmark always has been prosperous, and this is a very nice city, with a nice yachting harbor like Marblehead with yachts from many nations here, including one from the United States. Had dinner at the Yacht Club, and the King was having a party upstairs, but I didn't see him. Have just been on an auto trip and went by five of his houses he lives in in different seasons. A curious thing to see is nests on top of chimneys, with long legged storks. They arrive in this country, May 15, each year and leave, September 15 for Egypt and always come back to the same chimney. — Going from here to Holland — haven't found out yet how to get there — then to England. Home on the *Berengia*."

George Hooper has written several letters to Barney describing his various motor trips, including one to Yosemite which he said was crowded with tourists. He wrote at length about the various visits of his classmates to the Coast this summer. He is a grand host because he enjoys his own parties and enjoys giving pleasure to others. In his last letter he tells of his trip up the Redwood Highway and over the Golden Gate Bridge. Due to your Secretary's visit, he now knows all about sprinklers in hotels and seems surprised to find that several hotels in that country are so equipped. They even advertise that fact. The new highway

going north from Santa Cruz is not completed. Lack of space prevents quoting extensively from George's letters, especially his story about Sir Francis Drake's brass plate, recently discovered at Inverness. Perhaps we will have more space in the next Review, and will save this letter. George writes also of the engagement of his daughter, Mary, to Henry Boies Belden of Scranton, Pa. The following is from a local newspaper: "Miss Hooper, who is known to her many friends here as Molly Hooper, attended the Westridge School in Pasadena and the Santa Barbara Girls School. She is the recording secretary of the Junior League of Pasadena and a member of The Spinsters. Mrs. Everett Smith is her sister. Mr. Belden attended the Fessenden school and the Taft school in the east and was graduated from the Boeing school of aeronautics in Oakland. He is associated with the United Airlines in San Francisco. The wedding will take place in the early spring."

Bert Kimball took a trip east in September and visited some of his relatives, spending several weeks in Maine. He called on several of his classmates in and around Boston and, just before he started back, we motored to Cohasset for a call on Barney and a chat of old times. Arthur Hatch expected to go with us but was laid up with a cold. Bert said that New England still looks good to him, and he has not yet gone native, as they say out in California, where he now lives. While our climate could be improved upon at times, those of us who have traveled over most of this country come back with a greater appreciation of the beauties of good old New England.

While Barney's difficulties in getting about do not diminish, he is the same bright and cheerful soul, whose chief pleasure is thinking, writing, or talking to his classmates. Go and see him if you can. — We find an error in the classbook. Somehow the two Waits got mixed and the one now living is Edward R. Wait of Winchester, Mass., who is in the real estate business. Henry H. Wait of Chesterton, Ind., died on November 16, 1931. — Howard A. Dill of Indiana is now one of the directors of the American Water Works Association. — We have received the following changes in address: Arthur Hatch, 81 Strathmore Road, Brookline, Mass.; Elisha Bird, The Brentwood, White Plains, N.Y.; Charles Ricker, 2989 Washington Boulevard, Cleveland Heights, Ohio. — HENRY A. FISKE, Secretary, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I. BARNARD CAPEN, Assistant Secretary, Early Convalescent Home, Cohasset, Mass.

1893

Ernest C. Bryant, after devoting practically all his professional life to educational work as professor of physics at Middlebury College, Middlebury, Vt., reached the emeritus age last June, as announced in the following letter to the Secretary: "I retired from active teaching this Commencement, and therefore am

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free to attend the 45th class meeting of 1893 on any old date which may be chosen. I will be there if it is physically possible. My term of service happens to be the longest period of active teaching in the history of this college, although it is far short of the records at other institutions. It has been a very happy life, in work which I have loved, and which has included two delightful years abroad. These were spent in study and research at Cambridge University, with travel in England and on the Continent in the vacations. Among the many delightful memories of our life in Cambridge are those of the kindness and friendliness of Robert S. Ball '91, and his charming family."

Bryant was graduated from Middlebury College in 1891 and spent the two following years at M.I.T., graduating with the Class in the Civil Engineering Course. After a year and a half with the Canadian Bridge and Iron Company at Montreal, he began his teaching career at Middlebury, January 1, 1895, as professor of physics and mathematics. Long interested in astronomy, he spent the summer of 1921 at Yerkes Observatory. He is the author of "Color Transparency of Ray Filters at Yerkes Observatory," "The Ideal High School Course in Physics," and other writings, and has delivered various addresses on physics and astronomy before scientific societies.

Henry B. Dates, professor of electrical engineering (in charge of the department) at Case School of Applied Science, Cleveland, Ohio, has been honored by election this year to the presidency of the Illuminating Engineering Society. After some three years' experience with the Westinghouse Electric and Manufacturing Company at Newark, N.J., and East Pittsburgh, Pa., Dates embarked upon the teaching career which has been his lifework but which has been combined with outside professional work. In 1896 he organized the electrical department of the Clarkson School of Technology at Potsdam, N.Y., of which he was in charge for seven years as professor of physics and electrical engineering. From 1903 to 1905 he was dean of the College of Engineering and professor of civil engineering at the University of Colorado at Boulder, Colo. Since 1905 he has held his present position at the Case School of Applied Science.

Albert G. Davis, formerly Vice-President of the General Electric Company in charge of its patent department, and since 1933 a partner in the law firm of Pennie, Davis, Marvin, and Edmonds of 165 Broadway, New York City, withdrew from the latter firm on September 15 and opened an office for the practice of law in the R.C.A. Building, 30 Rockefeller Plaza, New York City.

Mrs. Edward Dana Densmore of "Locust Lawn," Princeton, formerly of Brookline, Mass., has announced the engagement of her daughter, Miss Anne Densmore, to Peter Stuart Hay Moore, son of Mr. and Mrs. Herbert Moore of Sewickley, Pa. Miss Densmore is a graduate of the May School and of Smith

1893 Continued

College. Mr. Moore was graduated from Kent School and attended Princeton University. Edward Densmore, a popular member of the Class, formerly of the engineering firm of Densmore, Le Clear and Robbins of Boston, died in 1926.

Mr. and Mrs. William Stuart Forbes of "Lone Tree Farm," Hamilton, Mass., announced at a luncheon in June the engagement of Mrs. Forbes's daughter, Miss Harriet Cox of New York, to Norbert C. Hansen, also of New York, son of Mr. and Mrs. Hugo Hansen of Schleswig-Holstein, Germany. Miss Cox, whose father is William Rowland Cox of New York, attended the Ethel Walker School in Simsbury, Conn., and later studied at Miss Nixon's in Florence, Italy. She is a member of the New York Junior League. Mr. Hansen is engaged in banking in New York. The marriage occurred late in August at the Forbes's summer place at Phippsburg, Maine.

At the fall convention of the American Society of Civil Engineers held in Boston last October, Charles M. Spofford presented a paper on "Reconstruction of the Deck and Footings of Commonwealth Pier No. 5, at Boston, Mass.," and Frederic H. Fay presented a paper on "Economic Advantages of Orderly Planning of Public Works."

Arthur Augustine Buck died suddenly on August 5 at Bucksport, Maine, the ancestral home of his family, less than three months after his return there from Schenectady, N.Y., where he had resided for 38 years. On the eve of his departure from Schenectady, May 17, he and Mrs. Buck were tendered a testimonial dinner by the citizens of that city in recognition of his notable civic work in founding, in 1927, the Municipal Research Bureau, of which he was the first president. His service through that bureau during the last ten years of his life, and that, too, under the handicap of loss of eyesight, was a most important factor in overthrowing the old political régime and in securing for Schenectady a new city charter and a clean municipal government under a city manager. A Schenectady paper in an editorial last spring said: "As a piece of unselfish civic service, Mr. Buck's work in this respect stands quite unparalleled."

For Buck, however, civic service was but an avocation; his main lifework lay in the field of patent law. Upon his graduation with the Class in electrical engineering he spent a year in the testing department of the Lynn Works of the General Electric Company. In 1894 he was appointed assistant examiner in the United States Patent Office. During the five years he remained in Washington in this position, he studied law, was graduated from Columbian (now George Washington) University with the degree of LL.B. in 1897, and was admitted to the bar in 1899. In the latter year Albert G. Davis, who two years before had been made manager of the patent department of the General Electric Company, persuaded Buck to join him at Schenectady. Here he remained, for a long time as assistant manager and subsequently as

patent counsel, until 1931, when, because of failing eyesight, he was retired at his own request. Even after his retirement, however, the company retained his services in a consulting capacity. Buck was married in 1903 to Miss Elizabeth G. Davis, who died many years ago. In 1930 he married Miss Alice Forsyth, who survives him. Born April 6, 1870, at Bucksport, Maine, Buck had passed his 67th milestone at the time of his death.

Edward Bullard Carney, former President of the Class, died on October 20 at his residence, 25 Plymouth Street, Lowell, Mass., after a long illness. Born in Lowell on June 8, 1871, he made that city his lifelong home and for the greater part of his life was prominent there in banking and civic affairs. Following his graduation with the Class in mechanical engineering, he spent two years in "odd jobs and travel," and from 1895 to 1906 was assistant city engineer of Lowell. In the latter year he became treasurer, and in 1934, president, of the Lowell Institution for Savings, from which he retired in 1936 after 30 years' service. This bank was known locally as "the Carney Bank" because for 107 years its affairs were wisely administered by three generations of the Carney family. It was founded in 1829 by his grandfather, James G. Carney, the first treasurer. At his death in 1869 he was succeeded in that position by Edward's father, George J. Carney. Upon the latter's death in 1906, Edward was elected treasurer. In savings bank circles he was well known as an active member of the Massachusetts Savings Banks Association and a former president of the Massachusetts Savings Bank Officers' Club.

In his home city Carney was for a number of years treasurer of the board of trade and among other civic activities served as treasurer of the Lowell Guild, of the Lowell Dispensary, and of the Red Cross during the War drives. As class president from 1912 to 1914 it was Carney's lot to preside at the highly successful 20th anniversary reunion held at the Hartford Yacht Club, Saybrook Point, Saybrook, Conn., June 13 to 16, 1913. He also served as president of the Technology Club of the Merrimack Valley. In 1904 he married Miss Lovina Rice Butterfield, who survives him. For many years Mr. and Mrs. Carney maintained an attractive camp on the banks of the Merrimack River, a few miles above Lowell, where Mr. Carney indulged in his hobbies of fish culture, forestry, and carpentry. The camp is near the Vesper Country Club, of which he was long an active member. For some years he was a member of the Boston City Club, and he was a member also of the Masonic Fraternity.

Willard Adna Marcy, who was graduated with the Class in the Mechanical Engineering Course, died, June 10, at his home, 112 Melrose Avenue, Syracuse, N.Y. He was born October 15, 1870, at Newton, Mass. Following his graduation he was employed successively by the Saco-Lowell Shops, Newton; by the Planters' Compress Company, Boston;

and by G. K. Hooper, consulting engineer, New York City. From 1905 onward, he was associated with the Lamson Company at Boston, Lowell, and Syracuse as construction superintendent, chief draftsman, designer, and finally mechanical engineer. He married Miss Jane Locke in 1915, and they have one son, Willard, who received his degree from the Institute last June.

Five other members of the Class, who were perhaps less widely known because they were with us for only a year or two as special students, but who have ever since been enrolled as members of '93, have died in recent months: Mrs. A. C. Gill (Ella E. Eaton), whose home was at 403 Wyckoff Avenue, Ithaca, N.Y., died on November 17, 1936. After having been graduated from Smith College, Mrs. Gill took special work with the Class in our sophomore year. — Edward S. Baumann of Saratoga, Calif., died December 8, 1936, in his 71st year. For two years, 1891 to 1893, he was with the Class as a special student in architecture. For some years, he practiced architecture in Chicago and later was manager of the Park Fire-Proof Storage Company at 1750 North Clark Street in that city. In 1917 he removed to California where he lived, first at Terra Bella, and later at Saratoga. — Alfred Copeland Turner of Newton, Mass., for some time with the Class as a student in the architectural course, died on July 2. For a while he practiced architecture in Boston and then became identified with the Newton Pure Food Company of 421 Auburn Street, Auburndale, of which he was president and treasurer. — George M. Hooper, a member of the Class during our freshman year, died, July 3, at his home, 39 Chester Road, Belmont, Mass. Long identified with the automobile industry, he was latterly assistant manager of the Bowdoin Square Garage, 91 Cambridge Street, Boston. — William Dunham Jackson, banker, former educator, and a leader in civic affairs of Bridgewater, Mass., died on July 31, at the age of 79 years. While a teacher at the State Normal School in Bridgewater, he was a special student with the Class from 1891 to 1893 in the Physics Course. Born in Halifax, Mass., he attended the Bridgewater Normal School, taught for three years at the Royal Normal College of the Blind in London, England, and returning to Bridgewater was a member of the Normal School faculty from 1883 to 1926. He had served as director and vice-president of the Bridgewater Coöperative Bank, president and trustee of the Bridgewater Savings Bank, member of the board of selectmen, town moderator, and trustee of the public library.

The following changes of address have been received by the Secretary: George W. Andrews, 3386 Ingleside Road, Shaker Heights, Cleveland, Ohio; Leighton Calkins, 929 Madison Avenue, Plainfield, N.J.; John C. Hawley, 230 Connecticut Avenue, Washington, D.C. — **FREDERIC H. FAY, Secretary**, 11 Beacon Street, Boston, Mass. **GEORGE B. GLIDDEN, Assistant Secretary**, 551 Tremont Street, Boston, Mass.

1896

Letters recently received by the Secretary have the letterhead "R. E. Bakenhus, Consulting Engineer, 142 Maiden Lane, New York," indicating that Bakenhus is continuing most active and practicing his profession. Officially his full formal title is "Rear Admiral Reuben Edwin Bakenhus, Civil Engineer Corps, United States Navy, Retired." He was in Boston at the American Society of Civil Engineers the first week in October, but he was so busy that the only contact the Secretary had was by telephone to him at the Hotel Statler. He was in Boston again on October 29, when as president of the Society of American Military Engineers he gave a talk entitled, "Public Works of the Navy," to the Boston post of that organization, and the Secretary had a very enjoyable luncheon with him in Walker Memorial that day.

Arthur Baldwin has sent a copy of *Franco-American Trade* containing an account of the decoration conferred upon him, as mentioned in a previous issue, and speaking in the highest terms of Arthur and his accomplishments. — Lythgoe has also sent a reprint of his article entitled, "The Enforcement of the Bedding and Upholstered Furniture Laws of Massachusetts," which appeared in the October issue of *The Bedding Manufacturer*. It contains a very interesting account of some of the problems that Lythgoe has as director of the division of food and drugs in the Massachusetts Department of Public Health, and some of the frauds discovered, and subsequent prosecutions. — The 20th report in the present series by the state geologist of Vermont has come to hand, and the author is Elbridge C. Jacobs, state geologist and Fellow of the Geological Society of America. As reported last month, the Secretary lunched with Jacobs in Burlington, Vt., in September, but failed to tell about the trip that Jacobs took with his wife in August by automobile around the Gaspé Peninsula, and through New Brunswick, Nova Scotia, and Cape Breton. The interesting part to Jacobs was that this was the first revisit to Cape Breton that he had made since he, with the Secretary and other miners of '96, had their summer school in the vicinity of Sydney, Cape Breton, in 1894. The Secretary has revisited this section more than once, but it was most interesting to Jacobs to see this country again, and especially to note the changes that had taken place in 40 years.

A letter from Karl Pauly in Schenectady during the summer stated that he was living a quiet, sober, and sedate life, especially during the hot weather, but he was pursuing his geological hobby whenever opportunity offered and, having at that time learned something about marine life through fossils, he was very desirous of spending a few weeks at the seashore to be brought up to date. — The versatility of Technology men in general, and of '96 men in particular, is well exemplified by Harold S. Boardman, whose retirement from the presidency of

the University of Maine was reported some time ago. Now that Boardman has had a rest and gotten back to normal health he desires activity, with the result that he is now chairman of the Maine State Liquor Board. No word has been received as to what special qualifications he submitted for this position, but it must be assumed that they were adequate, and that the governor, or whoever appointed him, must have been fully satisfied that he could handle satisfactorily all liquor problems that might come up.

Joe Driscoll, who passed away on May 26, had always been one of the leading and popular members of our Class. He was graduated in civil engineering and, as a student, was a member of the Civil Engineering Society, the track athletic team, and the class day committee. He was born on September 15, 1873, in Brookline, and was the son of James and Mary Frawley Driscoll. He married, October 19, 1904, Miss Martha E. O'Connell. There were no children. After graduation he immediately entered the employ of the Boston Transit Commission and remained until November, 1897. From then until April, 1899, he was inspector and day superintendent, Section Number 6 Boston Subway, Engineering, Street Laying Out Department. He became partner in the firm of James Driscoll and Son, May 1, 1899. In February, 1911, he became treasurer of James Driscoll and Son Company, and continued until 1916, when he became president and treasurer, which positions he held until his death. He was a member of the Engineers Club, Commonwealth Country Club, Derryfield Club, Knights of Columbus, Boston Society of Civil Engineers, Brookline Kiwanis Club. He was vice-president of the Brookline Savings Bank and director of the Brookline Trust Company. He was also connected with the Brookline Co-operative Bank and a member of the Tin Whistle Club of Pinehurst, N.C. We always looked forward to seeing Joe at class gatherings and, particularly, at our five-year reunions. He was thoroughly businesslike in all the dealings of his firm in the field of contracting, and he performed many satisfactory jobs of construction and general contracting. He served the town of Brookline faithfully in its civic affairs. He was almost inexhaustible in his fund of knowledge, and was continually consulted by people who desired information along all sorts of engineering lines. He took keen enjoyment in his home life, and his devotion to Mrs. Driscoll was marked. Whether in work or in sport Joe entered the game thoroughly and gave it all that he had. There is a strong feeling of personal loss among all of us. His death came rather suddenly, as he had been in apparently good health up to May 22. He played golf that afternoon, but came home complaining that he did not feel just right. He did not care for any supper and went to bed. Pain developed, and during the night the doctor was summoned. An immediate appendicitis operation was decided upon. This operation was satisfactory and no complications resulted.

Joe was apparently making a normal recovery for 24 hours or more, and then he had a gradual relapse, until death came on the evening of May 26. Apparently the shock of the operation may have been such that his heart was not equal to the strain of recovery. Representatives of the Class attended the services, which were held in St. Mary's Church in Brookline on Saturday, May 29.

William J. Batchelder, who died in San Diego, Calif., February 26, after a long illness, was born October 2, 1873, in Boston, the son of John L. and Augusta Lewis Batchelder. He originally entered M.I.T. with the Class of 1895, and remained from 1891 to 1894, changing over to the Class of '96 and taking a Course in General Studies. He was with a stock exchange house in Boston for three years after leaving Technology. Then his health broke down and he was sent to Colorado for the benefit of his lungs, where he lived for ten years. He then went to Europe for two years. After that he made his home in California, with headquarters at Los Angeles. He engaged in various ventures in California, including real estate and land operations. He was secretary and treasurer of the Seaboard Petroleum Corporation of Los Angeles and had been president of the Seaboard Gasoline and Refining Company. At the time of the Spanish War he was a member of Battery A in Boston, but did not have active service. He was one of the outstanding athletes of his time, and while he returned to the east only at long intervals, he will always be remembered by those who knew him. His class interests and Technology interests had never, as far as the Secretary is aware, prompted him to take any active part in class affairs, or in Technology or alumni affairs. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1901

During the latter part of September, Joe Evans, the honorable Vice-President of our Class, wrote me a very interesting letter, in which he made reference to an article which appeared in the *Saturday Evening Post* of September 25, entitled, "P.W.A.'s Problem Children," by Neil M. Clark. Joe by no means agreed with all of the article, and as he is located in Nebraska and is prominently connected with the P.W.A. operations for that state, he is in a position to know what is going on. When he wrote that he believed that good work was being accomplished in his state, we may be delighted, for comments to the effect that other alphabetical funds have not been equally well dispensed have been heard.

Reference to Fred Clapp's interesting work in Afghanistan, and so on, were made in the class notes of March and June. Further information is now received to the effect that Fred has accepted the position of vice-president of the Amiranian Oil Company and Inland Exploration Company, and that he left on August 17 to take charge of the explora-

1901 Continued

tions of these companies in Asia. Amiranian is reported to have a concession of nearly 200,000 square miles in northern and eastern Iran, and Inland has similar rights covering Afghanistan. Fred may be addressed in care of the Imperial Bank of Iran, Baghdad, Iraq. Baghdad makes one think of the Arabian Nights, so we may be glad that Fred's family is accompanying him to Iraq, and will undoubtedly find most interesting the motor trip from Beirut across Syria and Iraq, and will join him later in Afghanistan after he has visited several field parties operating in the north and west of that country. — Phil Potter writes that he has finished his supervisory work in connection with the water supply system for Montclair, N.J., and will be glad to receive any leads to similar work elsewhere, as that is his specialty.

The Alumni Office advised us of the death, on August 10, of John A. Trott, who was reported as having been chairman of the Shoe Goods Convention Association of 10 High Street, Boston. Trott took Course II at Tech, and after he finished was associated with his father in the manufacture of surgical and jewelers' cotton. Later he was connected with the Pacific Mills in Massachusetts and the National Lead Company in New York. He leaves a widow, Mrs. Elizabeth Dallas Trott, and a daughter.

George Cross, who is a retired captain of infantry, United States Army, was recently induced to become the executive director of the Worcester Historical Society, which he states is a somewhat far cry from Army service, but one which is fascinating in many respects. He admits that he has much to learn about the multitude of antiques to be found in the historical museum, and intimates that he expects to lead a most interesting life from now on. I hope to call on him when I am next in Worcester, and am sure that all other '01 men would be most welcome. He mentions, incidentally, that his last youngster, a daughter, was born on September 25, 1933, so that he has an idea he may be the parent of the youngest class baby. — At the time these notes are being written (October 15) a reasonably good response has been made on the class data sheets sent out with the annual class letter on September 28, and many further responses are hoped for. — Your Secretary and your Assistant Secretary have recently been requested by Elbert G. Allen '00, director of the Alumni Fund Campaign, to take as active an interest as possible in this worthy cause. We hope that if everyone who is able to do so has not already designated as liberal a contribution as possible, he will now do his bit to make the campaign a success. — ROGER W. WIGHT, *Secretary*, Care of The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

Bosworth's concern, the Denver Fire Clay Company, has recently announced that expansion of business has caused

them to consolidate their three Denver locations into one large unit at 2301 Blake Street. This change gives better railroad and space facilities and speaks well for the energy of their President. — Paul Weeks has returned from Peoria, Ill., to his old stand, the Munsey Building, Washington, D.C. — Howard Turner is with the Frosted Wool Process Company at 10 High Street, Boston.

Sawyer is constructing the new buildings of Northeastern University on Huntington Avenue, Boston. — In September, Bert Sherman visited his daughter, Mrs. John R. Earl, in St. Paul and then toured through the Rocky Mountain district as far as Salt Lake City. — Ann and Ellen Greeley, Roger's twins, entered Wheaton this fall. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

1903

Since our last appearance in The Review, a number of events of interest to the Class have occurred. Taking them chronologically the first was a letter from Regestein, V. He was the only member of the Class who was interested and appreciative enough of the class notes and our appeal for news to write to us. We call this an event. Regestein has been connected with the smokeless powder department of the Du Pont Company at Wilmington, Del., for the past 28 years. During that time he has raised three daughters, two of whom have been graduated from Wheaton; the third expects to go there in another year. While none of them is married, Regestein says he is "not entirely devoid of prospects" of having a son-in-law. Incidentally, this member of our Class is already recorded as a prospective attendant at our 35th anniversary celebration next June. How many more can we count?

The next event was the annual Alumni Day on June 7. George Greene, V, Ruxton, II, Aldrich, II, Eustis, III, and Cushman, I, were each present at some part of the afternoon celebration, including the luncheon and Class Day. Six of us — Joyce, Ruxton, Aldrich, Eustis, and Cushman, and at the last minute Myron Clark — attended the dinner at the Statler. In May, Clark, by the way, gave a lecture to the senior class in engineering administration on "Management as I Am Seeing It and as You Are Liable to Find It." — In June, the *Electrical World* recorded the activities of the Electrical Engineering Institute at Chicago and carried an excellent picture of Mitchell, VI, who was elected vice-president, and a snapshot of Tuell, I, as one of the outstanding men of the industry. Mitchell is vice-president and general manager of the Georgia Power Company, and Tuell is with the Engineers Public Service Corporation. — We noted several vacation items in the public press in July. Regan, II, headmaster at the Dorchester High School for Boys, with his wife, daughter, and son started on a trip on the 12th around the world, to include a motor trip through the British Isles before going to the Continent and returning by way of India and the Pacific.

Swett, II, Professor of Machine Design and Secretary of the Faculty, accompanied by his wife and daughter, took a trip through the West Indies to British Guiana, leaving Boston on the 17th. Ferris, I, former state senator from New York, now chairman of the Lake Champlain Bridge Commission, presided at the formal opening of the Rouses Point Bridge on July 16. This was an event for Vermont and New York, as it opens a new route across the lake. The bridge proper is 1,790 feet long and, including the approaches, is a mile and a half in length. It takes the place of a ferry.

In July two deaths occurred. Laura S. Plummer, who is recorded as a member of the Class, although not graduating with us, died on the 14th. She took courses with us and later taught at the Emerson School in East Boston and afterwards became head of the hygiene department at Teachers College. She taught in Boston for almost 50 years. Charles J. McIntosh, II, died in Milwaukee on the 22d. He was prominent in many class activities and, after being graduated as a mechanical engineer, he was with the J. I. Case Company of Racine. About 1915 he organized the Federal Steel Sash Company of Waukesha, of which he was president at the time of his death.

We record two weddings: Early in the summer Howard, I, at last gave in and was married to Miss Alice Welch of Dedham. He must have been the last bachelor in the Class — or are there others? On September 20, F. A. Eustis, your Secretary, was married to Mrs. Clarence Farnsworth Churchill in New York City. At present they are on an extended trip in South America. Your Assistant Secretary is sure that the whole Class extends to both Howard and Eustis its sincerest good wishes. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.

1905

Every news reporter experiences the feast, then the famine. Last month the feast, this the famine. Evidently some of our Assistant Secretaries have been sitting smugly since their summer vacations, little realizing that classmates are vitally interested in their personal affairs, their accomplishments, their hobbies, their families, and so on. Speaking of hobbies, your Secretary, summoned by Grove Marcy to his summer home to tell him how to make a Jones Beach out of his muck bottom at Webster Lake, N.H., found Grove revelling in his hobby — raising apples and honey, cutting cordwood, surveying wood lots, and so on — on his farm. He said he was just laying out some work for Kenway, who was expecting to spend a vacation (?) with him shortly. Incidentally, the fee for some bum advice was a bushel of beautiful Macintosh apples, which was overpay at that.

Over the telephone last week a voice said: "Hello, Fred, guess who?" Answer: "Charlie Johnston." Repartee: "What a fine Secretary we have!" Charlie was in

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Boston on account of the death of Mrs. Johnston's father and, incidentally, enjoying a week of rare Boston weather and checking up on his home office. Charlie was very enthusiastic about a month just spent in the Canadian forests, fishing, hunting (specimens), and so on. He said he had a daughter in the Junior College for Women at New London, where Warren Loomis, VI, has a daughter in the same class. Charlie had just bumped into Bill Green, who (according to Kenway) is engaged in developing and building a very ingenious and novel line of machinery for conditioning glove leather. Bill's permanent address, if any, is care of Killington Manufacturing Company, Rutland, Vt. — Doc Lewis phoned us to tell us that Ralph Whitcomb's daughter, Margaret, is now a junior at M.I.T. and doing splendid work. Ralph's other daughter, Sally, having completed her training at the Massachusetts General Hospital, is now at Stillman Infirmary, Cambridge, taking care of Harvard boys. Imagine that! — George Perry, XIII, doesn't burst into our columns frequently, but the Boston papers tell of his appointment as chairman of the 1938 community chest in Quincy, Mass. Perry is now vice-president and general manager of the Quincy Electric Light and Power Company.

Robert S. Beard, I, is now quartermaster construction officer of the Second Corps Area at Governor's Island, New York. He has just returned from a two and a half years' tour of duty in the Philippine department. On the way home, he had a two months' leave in China and was in Peiping during the first two weeks of the fighting in that vicinity. He wrote: "It seemed almost unreal to be cut off in an ancient, walled city, with an invading army fighting at the city gates. We were glad to get out by traveling third class on first-class tickets on an overcrowded refugee train. Our six-foot son, Bruce, is now absorbing aviation engineering at M.I.T. We have a daughter, Margaret, in high school."

Albert Warren Wells, III, is with the investment department of Paul H. Davis and Company, 10 South LaSalle Street, Chicago, Ill. His youngest son, Dexter, entered M.I.T. in September and will take up architecture. Wells has a granddaughter, born in August. Speaking of grandchildren, Sid Strickland has been bragging about his third. He claims the class championship in the grandchild class. We mentioned this to Carl Graesser, expecting a rise, and got it. Carl says he never claimed quantity, just quality; also that he had the first grandchild and wants a cup, emblematic of this honor, to be presented at the next reunion. At the risk of being buried under birth certificates from all parts of the United States, the Secretary announces a Grand Grandchild Contest with appropriate cups for the first and the most. Class bachelors will please donate cups properly marked. Carl adds with customary modesty that he is to lecture on Tuesday noons at the Harvard School of Business Administration on the subject, "Labor Relations."

Gene Kriegsmann, I, writes: "I'm sorry I gave those other fellows such a handicap in the grandchildren race. I'm still in the bachelor race with Henry Buff. Since I last saw the boys at Old Lyme, I've been to Omaha, Jacksonville, and, finally, to the Washington office of the P.W.A. November first I report at the New York regional office. Ran into John Damon recently. O. C. Merrill, I, is also still here with the Interior Department. He engineered the Power Conference last year." — A newspaper clipping tells us that James A. Newlands, XI, represented the state of Connecticut at a flood control conference of the New England states in October.

Roy Allen, III — present address R.F.D. 1, Delmar, N.Y. — writes that he enjoyed the reunion at Old Lyme so much last June that he went back on Labor Day to see if the Boxwood Manor was still there — and it was. "Shall look forward to going back there for the next reunion, with the high light of Billy Ball's stories. A year or more ago I heard from Ed Smith. His two boys had graduated from the University of Texas and were with one of the large oil companies, one in the legal, the other in the operating department. Had a letter from Lloyd Buell, III, from Douglas, Ariz. He had been hoping to enter his boy at Annapolis." Roy inclosed a photo of the gang at Old Lyme, the only one that has appeared in the Secretary's mail to date.

Ralph S. Gifford died at his home in Plainfield, N.J., on September 18. Ralph, after graduation, studied at Leipzig University, Germany, then was with the Du Pont organization in Wilmington, Del., until about ten years ago. Since then he has been engaged in chemical research for the American Cyanamid Company.

Changes of address: Clarence E. Gage, II, our chief nomad, has returned to his winter quarters, 635 12th Avenue, North East, St. Petersburg, Fla.; Joseph C. Baker, II, can now be reached at 124 West Castle Street, Syracuse, N.Y. — FRED W. GOLDTHWAIT, *Secretary*, 175 High Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 75 State Street, Boston, Mass.

1907

Since 1935 Frederic E. Banfield has been works manager at the Whittin Machine Works in Whitinsville, Mass. — the organization where Phil Walker of our Class is maintenance engineer. Previous to that Fred had been with Saco-Lowell Shops, serving as assistant superintendent, superintendent, agent, and vice-president. He is the holder of several patents relating to the textile machinery and has done extensive work in engineering, research, and design of that type of equipment. A son, Richard, is 26 years old. His first wife died in 1925; he married again and has a 24-year-old stepdaughter, Jane L. Powers.

The following article regarding one of our classmates appeared in a Rochester, N.Y., paper during October: "Martin H. Eisenhart, chairman of the general committee for the fall meeting of the Ameri-

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can Chemical Society at Rochester, has been associated with chemical organization in Rochester since the formation of the Rochester Chemists' Club in 1912 and has been active on the committees in charge of the national meetings held in that city. A graduate of Princeton University in 1905 and the Massachusetts Institute of Technology in 1907, he entered industry as a chemist in the chemical plant of the Eastman Kodak Co. at Kodak Park in 1908, where he rose to assistant superintendent in 1911 and superintendent two years later. In 1917 Mr. Eisenhart left Kodak Park to become general superintendent of the Bausch and Lomb Optical Co. His foresight, zeal, and flair for organization in that industry quickly won recognition of the higher officials and in 1926 he was made vice-president and assistant general manager. Three years later he became general manager, retaining his vice presidency, and in 1935 reached the top of the great optical organization as president and general manager. His interests were not confined to industrial pursuits. Despite his great responsibilities in the industry which he leads, he somehow finds ample time to aid others, especially the youth of Rochester, to be better citizens and to live fuller lives. He is a director and member of the Executive Committee of the Rochester Mechanics Institute, a technical school which owes no small part of its early success to Henry Lomb, one of the founders of the Bausch and Lomb Optical Co.

"Mr. Eisenhart is also a trustee of the University of Rochester, of the Security Trust Co., of the Rochester Savings Bank, and of the Rochester Chamber of Commerce. Perhaps none of these honors and trusts means so much to him, however, as his work with and for the Boy Scouts of the Rochester area. He is chairman of Region Two, Boy Scouts of America, and honorary president of the Boy Scouts of America, Rochester Council. He takes great pride and pleasure in his association with these boys and in the honor they have bestowed upon him. He is popular with his associates. He knows by name the older employees in his organization and many of the younger ones. He is their friend, always interested in their welfare and always willing to aid them in adjusting their problems. He takes great pride in the popularity of the employees' dining room at the Bausch and Lomb plant, which has the enviable reputation that since he has been manager of the vast optical industry there has never been a complaint from the employees regarding the quantity nor quality of the food served." In 1914 Martin married Elsa M. Bausch and they have two sons and a daughter, the family home being at 1316 East Avenue, Rochester, N.Y.

Herbert L. Fletcher, VI, has been with the A.B. See Elevator Company, Inc., as salesman and engineer, since 1911. His office is at 168 Stuart Street, Boston, where the firm name now appears as Westinghouse Electric Elevator Company, inasmuch as the Westinghouse

1907 Continued

people bought out the other concern during 1937. Herbert was married in 1924, and the first child, a son, was born on Christmas Day in 1936.

It is always especially pleasant to give news regarding a man from whom we have heard nothing for many years — hence this full account concerning Harry R. Hall. He started as an assistant in the engineer corps in the maintenance of way department, Pennsylvania Lines west of Pittsburgh, for a year after graduation, and was a surveyor and draftsman at the United States Military Academy, West Point, for three months in 1908. He then became assistant in the engineering department of the Massachusetts State Department of Health, where he stayed until 1912. Six years followed as principal assistant and assistant chief engineer with the Maryland State Department of Health; then in 1918 he became deputy chief engineer of the Washington Suburban Sanitary District and in 1936 was promoted to chief engineer, his present position. Since 1936 he has also been lecturer in municipal sanitation at the College of Engineering, University of Maryland. He is a member of several organizations of civil engineers and water works specialists, having been president of the Maryland-Delaware Water and Sewerage Association and a member of the board of control of the Federation of Sewage Works Associations. Harry is married but has no children. His address is Hyattsville, Md.

Last spring we told of the then new connection that Bob Keyes had made with the Surface Combustion Corporation of Toledo, Ohio, but in June of this year he wrote that he had resigned from this concern; a letter dated July 15 told us of his return to his old job as chief engineer of The Cooling and Air Conditioning Corporation at Hyde Park, Mass., this being his present business and mailing address. We missed Bob at our reunion last June, as he usually is on hand for these events, but he was unable to reach Boston in time for our 30th. — During last September we called personally on John Kimball at his office at 49 Federal Street, Boston, where he is connected with the structural department of Stone and Webster, Inc., having been with this organization since 1912, with the exception of two intervening periods when he had other interests. John lives at 141 Perkins Street, Melrose Highlands, Mass. He has two sons, the older being in the class of 1940 at Dartmouth College.

With the exception of ten years as engineer with the Eastman Kodak Company, William S. Lucey has been connected with the paper industry and is now president of Stuart Paper Products Company, vice-president of Grays Harbor Corporation, and general manager of Grays Harbor Pulp and Paper Company, all located at Hoquiam, Wash. Bill is married, has a 15-year-old daughter, and lives at 303 West 10th Street, Aberdeen, Wash.

Back in 1907 we (Macomber, Packard, and the Secretary) did our thesis with Howard H. McChesney, but 30 years went by before we saw Howard again —

at our reunion last June. Inspector with Oneida Railway Company at Utica, N.Y., from 1907 to 1909; salesman with Crocker-Wheeler Electric Manufacturing Company at Syracuse until 1911; with Hall and McChesney at Syracuse until 1917; then salesman with Holcomb Steel Company at Chicago and their branch manager at Philadelphia until 1925; vice-president and sales manager for D. K. Bullens Company, manufacturers of permanent magnets at Pottstown, Pa., for three years; back with Crocker-Wheeler as sales engineer at Philadelphia; and since 1932 electrical engineer in charge of "limitorque" division in the manufacture of motor operators for valves with the Philadelphia Gear Works — this is Howard's business history. He lives at 411 Bryn Mawr Avenue, Cynwyd, Pa. (a suburb of Philadelphia), and has three daughters, the oldest of whom, a graduate of Vassar in 1934, is with the editorial department of the *Ladies' Home Journal* in New York City. Another daughter is a senior at Syracuse University, and the youngest is 11 years old.

Floyd Naramore, architect in private practice, has his office at 514 Central Building, Seattle, Wash. He has specialized in school buildings and writes: "Have been doing public schools and other educational buildings for so long that they seem unimportant, but I do believe my work has had a great influence in the raising of the standard of school buildings in the state." Floyd was married in 1925, but his wife and infant son both died in October, 1926.

A personal call at the office of William G. Perry at 141 Milk Street, Boston, in the fall of this year resulted in learning something about this classmate. A graduate of Harvard College in 1905, Perry received his degree in architecture at Technology with our Class. For a year he was a draftsman with Coolidge and Shattuck; attended the École des Beaux Arts, Paris, from 1908 until 1913; returned to his former association until 1915; and then for four years had independent practice in Boston, being also instructor in design at Harvard Architectural School from 1915 to 1917. Since 1919 he has been a member of the firm of Perry, Shaw and Hepburn, and they have achieved international prominence by their work as architects of the restoration of Williamsburg, Colonial capital of Virginia. This restoration has consisted of the reconstruction of the entire Colonial area with its historic buildings and the furnishing of them. Perry has addressed many organizations and written articles in various magazines on this subject. He lives at 25 Cottage Street, Brookline, Mass., was divorced from his wife in 1934, and has three children: a daughter who is married, a 25-year-old son, and a younger daughter.

Last June we received long-looked-for information direct from Marcellus Rambo, II. Until 1908 he was a special apprentice with the American Locomotive Company and then for a year was draftsman with Glover Machine Works, Inc., at Marietta, Ga. For two years he was a salesman of

Maxwell automobiles and then for two years he took a dental course at Northwestern University Dental School. Since 1913 he has been engaged in the practice of dentistry in South America, his home address being Avenida Presidente Wilson 134, and his office being Avenida Rio Branco 257, both in Rio de Janeiro, Brazil. He has done research work in the relation between contracted dental arches and physical and mental arrested development, in the relation between leprosy and dental caries, and the cause and correction of dental caries (disease of malnutrition). Marcellus was married in 1918, but has no children.

B. Karl Sharp, whose home is at 49 West Castle Place, New Rochelle, N.Y., writes that he is "measurer for the Cruising Club of America and assistant measurer for the New York Yacht Club (not supposed to be business) and sort of specialist on sailing racing yachts." A graduate in naval architecture, Becky was a draftsman at Bath Iron Works for a year, then with George Lawley and Son Corporation for a year, with Morgan Barney and others until 1914. "On his own" as naval architect in yacht work since then, he has "designed a few winning sailboats" (his own words). While with Morgan Barney he met and married in 1915 Miss Barney (the boss's daughter, as Professor Rogers would say), and they have two daughters.

Another personal call made by the Secretary in September was on Ray E. Shedd who, after 15 years as draftsman with the Massachusetts Highway Commission, was put in charge of layouts of new roads and new work on old roads with the Massachusetts Department of Public Works. Ray's office is at Room 540, 100 Nashua Street, Boston, and his home is at 73 West Chestnut Street, Wakefield, Mass. He has a 23-year-old son who is with the Hood Rubber Company, and a daughter who is attending the New England Conservatory of Music, where she is studying voice and piano.

Herbert Sullwold practiced architecture in St. Paul, Minn., from 1911 to 1928, when he moved to California. He has practiced in California until the present time, his home and office being at 519 Ocampo Drive, Pacific Palisades, Calif. From 1932 to 1935 he also ran a blueprint shop, which he sold out in 1936 in Santa Monica, where he expects to open an office again. Among his noteworthy commissions was that for the chapel of Our Lady of Victory, at St. Catherine's College, St. Paul, Minn. He also is the inventor of the "sull-sash," double-glazed, removable, inner-pane window. Sully has a married daughter and two sons, aged 26 and 21 years.

Robert E. Thayer started as a special apprentice with American Locomotive Company from 1907 to 1908, instructor at the Institute until 1911, and since then has been an editor and business manager. At present he is business manager of *Railway Mechanical Engineer*, *Car Builders Cyclopedia*, *Locomotive Cyclopedia*, and is also New England manager of *Railway Age*, with offices at 30 Church Street,

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New York City. Bob, his wife, and their 25-year-old son live at 49 Smith Avenue, White Plains, N.Y.

Under date of August 18, Carl Trauerman of Butte, Mont., our very prominent and very loyal classmate, wrote us as follows: "Many thanks for your fine letter of the seventh of July, which I have been too busy to answer. Two of our mines have turned out very successfully and we are now trying to wean in the third and it looks very promising. Besides this, I have my organization work to do. The Mining Association of Montana just held its annual meeting and it was the most unique and largest meeting we ever have had. It took place at Virginia City, Mont., a famous gold camp, once our territorial capitol and the home of the famous vigilantes. Everything was carried on, in the vogue of the early Sixties, even to dress and whiskers. The stage was held up, vigilantes captured the robbers, some of whom were 'shot' and four were 'hanged.' It was a very good pageant. Besides this we accomplished a lot of good work and I was drafted into the presidency once more, starting my fourth term. In early September I will speak in Salt Lake City on the Securities and Exchange Act at the American Mining Congress meeting, our big national organization, of which I am a member of the governing board. Inclosed is a program, so you can see that among the speakers I am just a small frog in a big puddle."

Carl makes this comment in view of the fact that the speakers included state governors, United States senators, and government officials. On September 30 he wrote us again: "Here are a few items on some of my recent activities at the Salt Lake convention of the American Mining Congress. One of the greatest pleasures I had at the convention was meeting Jack Kinnear for the first time in 30 years. He looks splendid and shows no sign of age. He and I both were reelected members of the western governing board of the American Mining Congress. As you already know, Jack is one of the real big men of Nevada, being general manager of the Nevada Consolidated Copper Company (a subsidiary of Kennecott) and head of the Nevada Mine Operators' Association. After I got back I had to go to a little place named Armstead, 89 miles south of here, and make a talk on the dedication of a new national park, dedicated to Sacajawea, the famous Indian woman guide and interpreter of the Lewis and Clark Expedition. Now I am going to have my remaining teeth pulled out, get some store teeth, and quit making speeches. I feel 90 years old."

Carl sent us clippings from Salt Lake City newspapers, and copies of two addresses which he made at the Salt Lake City convention. Lack of space prevents the reprinting of these, but they are incorporated in our permanent class records. One of his suggestions, however, is of more than class interest, and may at some time influence our national government. The following clipping from the Salt Lake Tribune of September 8 sum-

marizes it: "Establishment of a United States department of mines, with cabinet portfolio, was urged by the Montana Mining association Tuesday at the convention. The proposal was advanced by Carl J. Trauerman, president of the Montana association, during a discussion on federal aid for mine to market roads. The Montanan criticized the attitude of the department of interior toward road building which will help mine operators, and voiced the suspicion that 'someone high in authority must have been hooked on a metal mining deal.' He deplored the fact that the mining industry is compelled to lobby so much in order to protect itself, and declared that the logical solution would be the creation of the proposed new department. He specifically took issue with the government's willingness to expend money on such things as sewers, ski tracks and toboggan slides and its unwillingness to help finance mine to market roads. Money spent on such roads, he said, would actually accomplish a reduction in the relief load, because the men employed on the highway construction could find work as miners as the roads were completed."

Carl's reference in his September letter to the splendid appearance of John Kinnear can be confirmed by the Secretary, because by a mere coincidence, on October 14, when we were at the office of Elbert Allen, '00, director of the Alumni Fund Campaign to raise \$1,650,000, conferring with him about our class plans in this campaign, John was escorted into the office by Charles E. Locke '96. Mutual recognition by John and the Secretary followed, and we had a pleasant chat: — We have more material we might use in these notes, but we'll save it until next issue. — BRYANT NICHOLS, Secretary, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

As I write these notes for the December issue of The Review, the Alumni Fund Campaign for the new gym is in full swing. If, by chance, you have not yet subscribed, may I suggest that you do so at once so that our Class may make as good a showing as possible. — Of interest to the Class will be the announcement of the marriage on October 4 at Portland, Maine, of Mrs. Doris Ione Dyer to Lewis D. Nisbet. They will be at home after November 1 at 44 Montrose Avenue, Portland. Nisbet is a civil engineer in private practice in that city. His former wife, whom some of us very pleasantly remember as having attended our class reunions, passed away about two years ago.

While attending the regional meeting of the American Society of Civil Engineers, held recently in Boston, your Secretary was pleased to meet Joe White and his wife. After graduation, White was for a time connected with the United States Bureau of Mines at San Francisco, Calif., followed by a three-year association with the Braden Copper Company at Chile,

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South America. After returning to this country, he was with Morris Knowles, Inc., in Pittsburgh for a time, and since 1924 has been traffic engineer for Allegheny County, Pa. The Whites have three children, two older girls and a boy, Joseph, Jr., now about eight years old. — Molly Scharff is chairman of a subcommittee of the power division of the American Society of Civil Engineers — Depreciation and Obsolescence in Power Plants. On November 9, Molly was one of the speakers at an accounting conference held at the Edison Electric Institute in Detroit, Mich. His subject was "Depreciation and Accounting." Molly's son, Samuel, is now a student at Exeter Academy. — CHARLES R. MAIN, Secretary, 201 Devonshire Street, Boston, Mass. Assistant Secretaries: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

Your Secretary regrets to report the death of another classmate: Gorton James passed away on October 9, in Cincinnati. From the obituary notice, we learn that he met death by accident. His funeral was held on the afternoon of October 12 from the First Church of Brookline. Gorton was graduated from Harvard University in 1908, and then attended M.I.T. for two years. His business career, while varied, was interesting. After graduation from M.I.T. he served as secretary to the president of the New York, New Haven and Hartford Railroad for several years. He was assistant secretary in the Department of Commerce, domestic division, during Calvin Coolidge's administration. After service in Washington, he was associated with the engineering firm of Thompson Lichtner Company in Boston. He also wrote many articles on industrial management. At the time of his death, he was a professor at Miami College in Ohio. He is survived by his wife and two sons. — HERBERT S. CLEVERDON, Secretary, 46 Cornhill, Boston, Mass.

1911

Nineteen-eleven man Number 1: Harry Tisdale! Yessir, Harry's generous subscription was the first received for our Class in the current Alumni Fund Drive. Our popular Scarsdale classmate — New York City address: American Dyewood Company, 100 East 42d Street — leads what we hope will be a long parade of 1911 subscribers to this first appeal from our Alma Mater for more than a decade. Harry also advises that Joe Harrington, VI, and his family have moved from Scarsdale to 83 Elmwood Avenue, Highland Park, Ill.

Early in October an announcement headed, "James F. Duffy and Company, 1033 North East Avenue, Oak Park, Ill.," was received, printed in light blue on baby pink, advising that the Duffys have a baby girl. Congratulations, Jim and Mildred! — Don Stevens and his family took a glorious trip this summer from New York to Los Angeles via the Panama Canal. The trip included shore trips at Puerto Colombia, Barranquilla, Cartagena,

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Cristobal, Colón, Panama City, Balboa, San Salvador, Guatemala, and Mazatlán. The trip continued for several weeks after seeing the sights at Los Angeles and Hollywood, including stops at Santa Barbara, Leland Stanford, Berkeley, Lake Tahoe, Yosemite, San Francisco, Seattle, Bellingham, Canada for trout fishing, Puget Sound for salmon fishing, Yellowstone Park, and Chicago. The Stevens family left home on July 3 and returned on August 25.

Always most enjoyable is the annual Freshman Camp, and this year's last week-end in September was no exception. Two sons of classmates, who were there this year as counsellors, were Jack Herlihy '39, track manager, and Charlie Hobson '39, golf manager. Another delightful contact I had with the students occurred in late October. It was a "burial" of the old Hangar Gym, at which symbolic event I was asked to play the dirge.

Paul Kellogg of Stevenson and Kellogg, Ltd., management engineers, 970 Sun Life Building, Montreal, Canada, writes that on June 6 he became a grandfather, a son having been born to his daughter on that day. "During the summer," he writes, "we have been busy devising a plan by which all forest products industries of the Dominion could unite through associations." He also inclosed a booklet, titled, "The Mathematics of Management," in which he has worked out a most ingenious mathematical analysis of business, concluding with three principles of business behavior: Fixed cost is the all-important element in volume-profit relationships. Less additional sales volume is required to compensate an increase in fixed costs than for an equal increase in total variable cost. Decreases in fixed cost lower break-even-point volume to a greater degree than do equal decreases in total variable cost.

Congratulations to Heinie Zimmerman, Vice-President, United States Steel Corporation, on being elected to the board of directors of the American Standards Association as the representative of the American Iron and Steel Institute. In commenting on the appointment, the magazine *Industrial Standardization* says: "Mr. Zimmerman, who is in charge of metallurgy and research for the U. S. Steel Corporation, has been vice-president since 1933. He started his career as instructor of physical chemistry at M.I.T. in 1911, and since that time has been, successively, research associate, assistant director, acting director, director, and assistant to the vice-president of the American Sheet and Tin Plate Company until he joined the U. S. Steel Corporation as assistant to the president in 1932." We were also interested, Heinie, in the news story from the *New York World-Telegram*, titled "Big Steel" and vividly describing your interesting company researches.

Late in September Bob Haslam, sales manager of the Standard Oil Company of New Jersey, gave a lunch at the Hotel Pennsylvania in New York for Miguel Divo, an Argentine glass-eater and

sportsman, who had traveled 22,000 miles by automobile from Costa Rica.

Now that you are concluding this month's crop of class notes, how about that pledge card you received from the Institute a little over a month ago? Have you filled it out and sent it in yet? If you bow in the affirmative, thanks a lot; if the nod is negative, please do it now. And to all of you: Write to Dennie. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

Here's a fine letter recently received from Harold Manning: "I am writing to ask that you express my appreciation in *The Review* to the Class of 1912 for the fine way in which the members have responded to my request for negatives of still pictures taken at the reunion last June. Replies have already come in from 78 of the Class, and a considerable number of negatives have been received, which will be used to make up collections of prints for distribution to those members who desire them. So far, 27 men have subscribed for this collection. About 40 or 50 of the best pictures will be selected, and the price of the collection will be about three dollars. From the letters I have received, there is no doubt that the 1937 reunion was a glorious party and great success. Many of the Class would like to get together again before 1942 — one suggestion being that we have annual reunions at various locations, starting in 1938 at Niagara Falls. If such a gathering can be arranged next year, we could show the numerous motion pictures taken this year and at the previous reunions. To determine the feeling of the Class on this point, I would suggest sending out a questionnaire. . . .

Before we send out such a questionnaire, we'd like to hear from some other members who may have other and equally good ideas to offer. If we could get several different suggestions from various members, we might be able to get out something that would really stimulate interest and excite the Class to new and greater unity. There is much to be said in favor of some sort of annual reunion, and perhaps something to be said on the other side. Let's get all the viewpoints, then get out a survey of the Class, and see where the majority sentiment lies.

H. H. Sharp, III, has been made vice-president of the Howe Sound Company and is now located at 730 Fifth Avenue, New York City. His work takes him down to their Mexican mines occasionally, where he is able to keep track of his former pals at the American Refining and Smelting Company. — President Compton and family enjoyed a pleasant vacation at Dubois, Wyo., this summer on the T-Cross Ranch, a so-called dude outfit owned by R. S. Cox, III. After graduation, Cox followed mining for a short time and then located in Dubois on the T-Cross Ranch, where he ranches in a large way, as well as catering to a select eastern clientele. As public schools are

not easily accessible, their 13-year-old son is under the tutorship of his mother. Dr. Compton was somewhat surprised at the boy's questions regarding some of the phenomena of modern physics.

Eric Kebbon, IV, has been commissioned by the Corporation as architect for the new buildings which will be erected from the proceeds of the Alumni Fund now being raised. As Keb is also handling one of the larger buildings of the New York World's Fair, as well as several smaller jobs, he is very busy. — Milton Kahn, X, is again chairman of the Boston Federated Jewish Charities Fund.

Clarence Edgar Morrow, a senior engineer on the staff of Ford, Bacon and Davis, Inc., and a licensed professional engineer of the state of New York, died in New York City on June 6, after a short illness. He is survived by his wife, Mrs. Lou Hostetler Morrow; a daughter, Miss Claris Morrow, attending Smith College; and a sister, Miss Gretchen Morrow of Boston.

Mr. Morrow was born on September 5, 1888, in Columbus, Ohio, and later moved to the state of Washington, where he was graduated in 1906 from Pearsons Academy in Walla Walla. In 1910, he received the A.B. Degree from Whitman College, where he was a member of Washington Beta Chapter of Phi Delta Theta. During that period, his summer occupation in construction work in the Pacific Northwest evidenced that inclination toward the engineering profession which led to his graduation, in 1912, from M.I.T. with the degree of B.S. in architectural engineering. Following his college training, he served for several years as instructor in engineering at both M.I.T. and Lowell Institute. At the same time, in addition to writing the text on reinforced concrete design then in use by the latter school, he was in charge, for Welles Bosworth '89, of the preliminary structural design of M.I.T.'s buildings in Cambridge, and for Stone and Webster acted as structural engineer during their construction. He was architect's representative on the construction of the American Telephone and Telegraph Building in New York City and resident engineer during the erection of several factory buildings for the American Brass Company in Ansonia, Conn.

Leaving teaching at about the time of his marriage to Miss Lou Hostetler of Portland, Ore., Mr. Morrow progressed, in the employ of Stone and Webster, from structural designer to assistant chief draftsman in charge of employment and personnel and, finally, to the occupancy for nearly three years of the position of chief draftsman, in administrative charge of a department employing from 300 to 350 persons. The latter part of his employment by Stone and Webster was spent on special assignments for appraisal and other purposes, including studies and recommendations relative to projected new construction in utilities and other lines. The year 1921 witnessed a change in the type of Mr. Morrow's activities, signified by his joining the

1912 Continued

Boston investment banking firm of Merrill, Oldham and Company as a consultant on public utility financing. In 1923, he assumed charge of the public utility section in the buying department of the Guaranty Company of New York, where he was responsible for the investigation of management, property, accounting, and credit status of companies contemplating bond financing, and later for the writing of offering circulars, syndicate advertising and sales literature, as well as participation in the drawing of purchase contracts and in the preparation of banking features of trust indentures.

Mr. Morrow's service with the Guaranty Company not only took him into many parts of the United States and eastern Canada but also called for the spending of considerable time in London and later in Japan, where he participated in negotiating the details of several large utility and industrial security issues and commercial loans totaling nearly fifty million dollars. For five years, starting late in 1926, Mr. Morrow, as vice-president of G. E. Barrett and Company, investment bankers, gained extensive experience in the development, financing, and operation of natural gas, oil, and industrial companies, as well as of public utilities. The year 1931 he spent with Moody, Seagraves and Company, working principally on intricate problems involving credits and reorganizations of properties owned or controlled by that organization.

During the following three years, until early 1935, Mr. Morrow, in an individual capacity, was active as an investment analyst, consultant, and broker. His work during this time in certain corporate reorganizations and rate studies led to his employment in February, 1935, by Ford, Bacon, and Davis, Inc., with which firm he remained until his death, handling increasingly important assignments for which he was made principally responsible.

Much of his work during these last years has required detailed and comprehensive engineering and economic studies and reports upon many concerns of large size and national reputation, where his unusually broad experience and well-recognized talent for scrupulously complete and dispassionately logical study and consideration found application in such diverse fields as public utilities, motion pictures, distilled liquors, petroleum production, refining and marketing, the manufacture of paints and of glass, and the manufacture and distribution of pipe and fittings and valves. — **FREDERICK J. SHEPARD, JR.**, *Secretary*, 125 Walnut Street, Watertown, Mass. **DAVID J. MCGRATH**, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N.Y.

1913

Our 25th year reunion will be, without question, the most important class affair which we have ever had or ever will have. We plan for a get-together covering three or four days, early in June. The exact dates will, of course, be governed by

the Institute calendar. Our Class is not lacking in public spirit, even though we have a genuine dearth of correspondents with the Class Secretary. Our roster has 435 names, and we have 108 who are members of the Alumni Association. All of the latter receive *The Review*. The prospects for a very pleasurable reunion are good, with such reunion-minded pace-makers as Walter Muther, Geof Rollason, Dave Nason, and Jumbo Mahoney, to mention only a few of them. About the only thing to be decided is the type of party we shall have; 1911 had about 60 men and quite a few wives for the better part of four days at the Mayflower Hotel in Plymouth; 1912 chose headquarters in a Boston hotel and they had about 80 men, with a fair complement of wives for their party. We shall presently circularize the entire Class and ask each of you to indicate your preference for either the 1911 type or the 1912 type of reunion.

I was agreeably surprised one morning not long ago when Karl Briel, I, walked into my office. I recognized him immediately. Karl is looking around with a discriminating eye for a job. He has had an interesting business experience, lately, along the lines of factory efficiency work. This last summer he has had a lot of fun doing manual work in the completion of his home in Duxbury, Mass. Karl found out where I was from Rusty Sage, I, who occupies the position of placement manager for former students and graduates of the Institute.

I learn with regret of the passing of Joseph Oppenheim, V, on July 8. Joe was a substantial citizen of Newton Centre, Mass., and was engaged with three brothers in the furniture business in Cambridge.

I sincerely hope that our Class has the means and will show the disposition to help in the current Alumni Drive for funds to increase the recreational facilities at the Institute. Prescott Kelly, XI, of Birmingham is on the general committee of 100, and Bill Mattson is looking after the Greater Boston solicitation from our classmates. — **FREDERICK D. MURDOCK**, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

1914

Seven '14 men have just taken a renewed and keen interest in Technology. Why? Because their sons have just entered as freshmen. This is a sizeable group for a single year, and in each case their fathers are regular graduates of 1914 in the standard four-year course. Only one, Horton, is now associated with the Institute; in fact he has just been promoted to associate professor of biological engineering, and also is the only one in this group to have taken, subsequently, an advanced degree — the doctorate. The proud fathers are Herman Affel, Chet Corney, Phil Covitt, Warren Horton, Walter Keith, Howard Morrison, and Doc Richardson. Louis Wilson's son is now a sophomore, and Leigh Hall, Jr., is already an Institute junior. Associated with our Class, but officially classified with another, are Sam Breck, R. C. Foster, and Alex

Morrison, who all have sons in the sophomore class. If any classmate is considering sending his son to Technology but hesitates because of his memories of former conditions, let him write to any of these fathers — and also remember that the new student-activity building will be added in about another year, the Alumni being willing.

George Whitwell and your Secretary attended — as term members — the fall meeting of the Corporation on October 13. Buck Dorrance was unable to be present because he had to be on the Pacific Coast at just that time. — Frank Ahern has completed his annual western trip, which this time included the national parks of the Northwest and a visit to Mount Rainier. — Herman Affel has had another patent issued to him in the communication field. This time it covers a broadcasting system which will permit several stations to have the same program using a common-carrier wave.

Dean Fales spoke before the Boston section of the American Society of Mechanical Engineers, October 21, on the "Trends in Design of 1938 Automobiles." He was also busily engaged on Sunday, October 24, at The Country Club in Brookline, assisting in conducting an automobile gymkhana run under the auspices of the Automobile Racing Club of America. Porter Adams was also present at the festivities, and his sport Lagonda won the first prize in the Course d'Elégance class. — **H. B. RICHMOND**, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. **CHARLES P. FISKE**, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

1915

Now is the time for all good 1915 men to come to the aid of Technology. We are in the midst of the alumni drive for funds for the new gymnasium and athletic buildings. You have been told all this by letters from the Alumni Association, and I urge you now, with your loyalty to the Class and to Technology, to contribute generously to this fund. It will be doing a world of good for the undergraduates. It is a big job and your subscription is needed. Everyone is working enthusiastically on this, and all we are asking of you is a generous donation. Be sure to send in your check. This transcends all other class activities and I, therefore, want to leave with you the thought and appeal to do your best as a loyal Alumnus and a good 1915 man. — **AZEL W. MACK**, *Secretary*, 40 St. Paul Street, Brookline, Mass.

1916

Since your Secretary was on an extended business trip during the month of October (more of which later) and did not return in time to take care of the class notes for this issue of *The Review*, your Assistant Secretary is pinch-hitting. A great many of you undoubtedly heard from Jack personally as he toured the country. He visited Chicago, Kansas City, Omaha, Denver, Dallas, Austin, Houston, Galveston, Port Arthur, Beau-

1916 Continued

mont, and New Orleans. Incidentally, at Kansas City he attended the National Safety Council Congress and on November 9 at Washington, D.C., he attended a meeting of the Interstate Commerce Commission, Bureau of Motor Carriers.

In writing the class notes for the past year Jack, of course, has not told us of the effort that he has been putting into this work. Now that he is away, however, it gives me an opportunity to tell you fellows that he has worked mighty hard to put the 1916 notes up among the leaders, both in volume and interest, and I feel you will agree that he has been pretty successful. In fact, it is quite probable that last year represented the best showing that our Class has made for quite a long time. I know that if you fellows will make it a point to let him hear from you once or twice a year, giving him just a little friendly chitchat on what you are doing either in the way of business or pleasure, whom of your classmates you see, and any other news of interest, he will in turn give you a column every month that will make the national columnists and others blush. Furthermore, do not forget that we have had our 20th reunion and are now headed towards the 25th and that a good, interesting column the next few years will assure a mammoth turnout for this important event.

Now, speaking about reunions, if I remember correctly there were 72 registered at the 20th, which was pretty good, and since I have the list, here they are: Phil Baker, Joe Barker, Bill Barrett, Dick Berger, Steve Berke, Tom Berrigan, Walt Binger, Wesley Blank, Steve Brophy, Ray Brown, Jack Burbank, Jap Carr, Frank Chandler, Santa Claussen, Dinah Coleman, Bob Crosby, Theron Curtis, Ralph Davies, Kem Dean, Harold Dodge, Karl Engstrom, Jim Evans, Bill Farthing, Ralph Fletcher, Gaus Freeman, Jack Freeman, Gilbert Gaus, Barnett Gordon, Jack Gore, Leo Graves, Harold Gray, Paul Hatch, Tom Holden, Frank Hubbard, Dick Hunneman, Tom Jewett, Edgar Kaula, Bill Kniesner, Dick Knowland, Charlie Lawrance, Al Lieber, Chuck Loomis, Gene Lucas, Charlie Makepeace, Charlie McCarthy, Irving McDaniel, Joe Meigs, Joe Minevitch, Arvin Page, Ed Parsons, Dave Patten, George Petit, Lewis Pratt, Jim Ralston, Jack Robertson, Mel Rood, Dick Rowlett, Hen Shepard, Francis Stern, Leonard Stone, Norman Thompson, Hyman Ullian, Norman Vile, Porter Webber, Don Webster, Marshall Wellington, Jack Wells, Rusty White, Harold Whitney, Bob Wilson, Don Woodbridge, and Jack Woods. Now, as a starter, all you 70-odd fellows are requested to write to Jack for the next issue. One fellow in particular by the name of Thomas A. Berrigan, assistant chief engineer of the metropolitan district sewer division of the Commonwealth of Massachusetts is called upon to augment the notes below. Many congratulations, Tom. If you can't tell us anything else, let us hear from you about Honolulu.

Another fellow who, I know, has been very busy cutting up granite in Chelms-

ford and who makes a whale of a row at every reunion (but seems to quiet down afterwards) is Ralph Fletcher. Our former Secretary, Hen Shepard, is busy with his many business and civic interests, but I have seen him quite often and each time he has faithfully promised to write a few paragraphs for the class notes. We are putting the finger on you, Hen, and want to hear from you at once. This summer I saw John Robertson "rhumbaing" over the dance floor at the Casino in Falmouth, Mass., and he also definitely promised a few paragraphs. We want to hear from you, Robby.

I saw Dick Hunneman in the South Station in Boston about a month ago and he, as well as his associate, Santa Claussen, owes us a lot of news. — Wesley Blank was at the meeting of the Boston Society of Civil Engineers on October 13, and although I know he wrote us last year, we are waiting to hear from him again. Another fellow I bump into quite regularly, and who was also at the above meeting, is Al Kleinert. Al is one of the best bridge engineers in Massachusetts and is now working for the Commonwealth of Massachusetts in the bridge division of the department of public works. Let us hear from you, Al, and from all the rest of you fellows whom I cannot mention by name because of space limitations. I know you have a lot of stuff and we want to hear about it. So get busy and keep us posted.

Incidentally, your Assistant Secretary has been connected with quite a piece of work on the widening of the Cape Cod Canal in Massachusetts under the supervision of the Army engineers under Captain Hugh Casey and Colonel A. K. B. Lyman. While engaged in this work, I heard about Captain Al Lieber. Let us hear from you, Al.

When I last saw Jack Burbank, it was at a meeting of the Class Secretaries the last of September at Walker Memorial, in connection with the advance program in anticipation of the raising of \$1,650,000 for the enrichment of the student life at the Institute. By now, you should all have received President Compton's letter and the brochure and pledge cards in regard to this event. It is of the utmost importance that this amount be attained and we of the Class of '16 must do our part. Every bit helps, so send in the pledge cards for all you can afford and when the stock market goes up again and you find you have a little to spare, send in another card with some more dough. As the politicians say, "Vote early and often."

This month we have the following news: Harold H. Mitchell of 1825 Ditmars Boulevard, Astoria, Long Island, N.Y., has a new job as district health officer of Astoria, a district of the New York City Department of Health. The office of the Astoria Health Center is 1226 31st Avenue, Astoria. Best of luck in the new job, Doc. Undoubtedly you will see Walt Binger. Tell him to send Jack some news.

Ralph Millis writes that he has not let us down on the matter of news from Nel-

son MacRae, although it might seem so, but that he has been unable to see him as he has been in the western part of the state all summer, as usual. Ralph consulted his father about whether it would be any use to write to him, and Mr. MacRae said it would be no use at all because Nelson was working very hard (on a sort of summer resort or development that the family owns up there). Ralph says he agreed with the conclusion but not necessarily the premise, because he had a notion that Nelson was playing a good deal of golf. He says, further, that he is not a golfer and does not keep up with the tournaments, but saw in the paper that Nelson was a runner-up in a seemingly rather important state or several-state affair up in those parts. — I am glad to hear this much about Nelson. He was a particular pal of mine, and I would give a lot to hear from him.

The Hartford daily *Courant* makes the following comment about Frank Ross: "The Connecticut Golf Association is assured of a sane, safe and progressive administration through the election of Frank Ross, Hartford insurance man, as its president. Ross is — and has been for some years — one of the finest shot-makers and competitors in New England golfdom. If he had more free time from his business duties, it is believed that he would rate with the outstanding stars of the game he loves. But Ross is sane, sensible and progressive and he does not neglect his business to indulge in his outdoors hobby."

From the Boston *Evening Transcript* we learn that "on September 18th Miss Helen L. Flynn, daughter of Mrs. Cornelius B. Flynn of Dorchester, was married to Thomas A. Berrigan, son of Mrs. John F. Berrigan of Boston. The wedding took place in St. Peter's Rectory in Dorchester, and the ceremony was performed by Rev. Leo O'Day. The bride was given in marriage by her brother, Cornelius Flynn. Mrs. Robert Merrick of White Plains, New York, was her matron of honor and only attendant. Dr. Thomas P. Kendrick of Brookline was Mr. Berrigan's best man, and the corps of ushers included John Berrigan, of Jamaica Plain, Dr. William and Dr. Edward Flynn of Dorchester and Robert Merrick of White Plains. There was a reception afterwards at the home of the bride's mother. Mr. Berrigan took his bride to Honolulu for their wedding trip, and on their return they will live in Dedham, where they will be at home after Nov. 1. The bride attended Emmanuel College and Mr. Berrigan, the Massachusetts Institute of Technology." — JAMES A. BURBANK, Secretary, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, Associate Secretary, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

The sad news of the death of Henry C. Clayton last September comes to the Secretaries as these notes go to press. A tribute to him will be included in the next Review.

1917 Continued

Here is a letter from an embarrassed Assistant Secretary, who is not even yet sure that the reunion vote was official. It may be necessary for the Secretary to write minutes of that meeting; if so, you may be sure that the election of an Assistant Secretary will be recorded in due form. Phil's letter follows: "... As I wrote you earlier, I am very vague as to what my job is, if any, and I thought I might be able to get to town ... to sit down with you and find out. It turned out that I couldn't get away. ... Has there been an issue of *The Review* this fall? I have seen none and assume that the notes you now speak of are for the December issue. I suppose the reunion stuff appears in the November issue, though I have a feeling that a complete report of the reunion would have to be collected from several sources. As one such, I must confess to being somewhat of a total loss.

"Here are one or two items which you can use as you please. In view of the time of day and the 260 miles of Sunday traffic I have survived today, they are necessarily brief: Ed Woodward, IV, erstwhile architect, Coast Artillery captain, and rope manufacturer, is New England representative of the Monarch Marking System Company, with offices in the Old South Building, Boston. He is living in Winchester. Lin Noyes, IV, is the publisher of the Ironwood, Mich., *Daily Globe*. In September the *Globe* occupied a new building which is said to be the last word in newspaper plant design and to contain the latest mechanical equipment for the efficient production of a daily paper. The paper was founded in 1919 with Lin as business manager; for the last ten years, however, he has been in complete control as publisher. Well-founded reports indicate that the office of the publisher in the new building is furnished with the spoils of a summer raid on New England antique dealers. A Vermont melodeon will perhaps provide a pastoral accompaniment to the roar of the presses, and the cornflower goblets might do for inkwells — anyway, more power to the voice of the Gogebic Range. ..."

Other news sources report that Phil Cristal in Milwaukee is busy trying to reorganize some railroads, and that Rad Stevens in Elgin, Ill., last September was concerned with traffic problems of another sort — parades. It's nothing new for Rad to start a parade, even to lead one on a white horse, but this time his parade (it was for the local community chest) got going, only to split three ways on him. One part headed for Chicago, another down the Mississippi Valley, and a third toward Yellowstone Park. Our informant failed to say whether Rad ever got them back together again, but we understand he was to lead cheers at a dinner of the Technology Club of Chicago on November 30. Perhaps there is no connection between the two affairs. The toastmaster of the dinner was Penn Brooks, and from Seattle we heard that Penn had been making notes of stories to tell since last March. — RAYMOND STEV-

ENS, Secretary, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, Assistant Secretary, Phillips Exeter Academy, Exeter, N.H.

1918

Those of us who remember Don MacArdle, with temperament in full bloom, doing destructive things to the Tech Show orchestra by means of a boisterous cornet, those of us will not be surprised to hear that the Parent Teachers' Association of New Rochelle rocked on November 5 and 6 to a concert version of the "Mikado," dripping, nay gushing, from the baton of our own irrepressible Don.

These columns are kept lively with the incongruities of a strictly technical alumni body. This one could be a perfect eruption of our musical achievements: Shorty Carr, choirmaster and organist; Maggie Magoun, now rounding out his 18th year as bass in a Cambridge choir; Harry Camp ... ah, yes, Harry. He spent the family fortune to install a pipe organ in his home (Reading, Mass.). The dear thing is worth much more than the house, which it not only furberishes but occupies — all except the kitchen, the upstairs bath, and the front hall. Down cellar is a two horse-power motor; up attic and far from agonized with paralysis are two swell-box motors and the tremolo stop. The relay and all switching apparatus is in the bedroom closet, so help me! Not counting the furnace, there are over 700 pipes. For instance, there's the dulciana stop that does sweet singing and can be "fattened" (that's just what Harry said) by flicking over the gadget marked "flute." He showed us, playing some contrapuntal music of Clerambault's and if you don't like the composer or the organist you can have your money back. There are two banks to play on, not including the First National, and some extra contrivances labeled "Swell" and "Great" — if you like that kind of music. Harry does a lot of professional work for an organ builder. Apparently he needs an instrument around home, with which to unpack his singing heart, or through which to achieve sweet composure of the spirit, or by which to disperse the mosquitoes of a summer's eve. Anyhow, he's got something that left us all atwitter, resolved hereafter to be a better man.

Bill Costelloe's death will come as a great shock to many who were anticipating seeing him again at the reunion. Apparently in excellent health, he died from a heart attack on the evening of July 27 while relating an anecdote to a group of friends at a gathering in South Orange. Bill did graduate work at Harvard, was a radio officer in the aviation service during the War, and had given 11 years to the research department of the American Telephone and Telegraph Company before transferring to the Bell Laboratories, five years ago. He is survived by Mrs. Costelloe, son William and daughter Dorothea, to all of whom go our sympathy. — F. ALEXANDER MAGOUN, Secre-

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tary, Room 5-328, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, Assistant Secretary, The Thomas School, The Wilson Road, Rowayton, Conn.

1921

To every member of the Class has been sent a special letter heartily endorsing Technology's program for enlarging the scope of athletic and other extracurricular activities, and we hope that no one has failed to take advantage of this opportunity to participate in furthering the advancement of the Great White City on the Charles. From our own experience as the second Class to spend its entire undergraduate life on the Cambridge side, we know full well the needs of campus life which are being so splendidly filled in the present project sponsored by the Alumni Association. The plans have been made with the usual thoroughness and foresight for which the Institute has always been the outstanding leader, and we can all share in the pride and personal satisfaction of their ultimate translation into useful monuments attesting the love of all who have in any way been associated with Technology. To all who have already climbed aboard the band wagon are due the grateful thanks of present and future administrations and students; to those who may have overlooked this chance to serve and reap the glory which is the rich reward of worth-while accomplishment, send in your subscription now.

We recently had a very pleasant meeting with S. Paul Johnston, editor of McGraw-Hill Company's *Aviation* magazine, and the discussion naturally turned to Technology men in aeronautics. At our query about Herbert V. Thaden, Paul hauled out a copy of his August issue. In it appeared the first of a series of articles by Herb, entitled "What Plane Shall We Buy," containing a complete analysis of equipment evaluation. Early in October, the Carnegie-Illinois Steel Corporation announced Herb's appointment as sales engineer in the stainless steel division, with headquarters in Pittsburgh. With long experience in design, manufacture, and operation of both lighter- and heavier-than-air craft, Herb will now devote his efforts to the technical and business development of stainless steel products for aircraft use. For the past few years he has been engaged in aviation sales work and has specialized as a consultant on the economics of aircraft manufacture and operation. Previously he had been an executive in General Aviation Corporation and in his own all-metal airplane manufacturing plant. Herb holds the rank of major in the Air Corps Reserve and is an active pilot. To make the story of 1921's aeronautical family complete, Mrs. Herb (better known as Louise Thaden) also has many flying records to her credit.

A note from C. E. Locke '96 tells us that H. E. McKinstry made a trip to England last summer and in September went to Idaho for some geological work, making his temporary headquarters in Wallace, Idaho. Hugh maintains a con-

1921 Continued

sulting mining engineering office at 120 Wall Street, New York City, where we hope to corner him some day and get a story of his travels, especially his trips last year to India and Australia.

We know the Class will want to join us in extending sincere sympathy to Ray St. Laurent in the recent passing of his father. — Ran into S. M. Silverstein on his return from the Savannah convention of the Trade Association of the Pulp and Paper Industry. Sol is technical director of Rogers Paper Manufacturing Company in Manchester, Conn. He reported seeing Albert E. Bachmann (Red, to you!) who is back East from his trek to Wisconsin and is now manager of the Vermont mill of Missiquoi. Report hath it that Red is married and has one child.

Irving D. Jakobson, President of Jakobson and Peterson, Inc., boat builders, of Brooklyn, N.Y., was the only other member of the Class we managed to locate at a recent meeting of the Technology Club of New York. Irv is active in scholarship work and has been made an honorary secretary of the Institute. — Sumner Hayward, William Rose, Jr., and M. K. Burckett are among those of the Class active in the M.I.T. Club of Northern New Jersey. Sumner, who is with the New York Telephone Company in Brooklyn, recently engineered a regional social for the Tech men in the vicinity of his home in Ridgewood, N.J. Bill Rose is active on the luncheon committee of the Club, and Max Burckett was a member of the program committee which put over, with a lot of enthusiasm, the November smoker for President Compton.

A very merry Christmas and a happy New Year to all — and may your Alumni Fund subscription make it merrier and happier! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

1922

It is probably too soon after summertime vacations and activities to expect much information from our far-flung Class, but voluntary information as to the doings and the whereabouts of our illustrious classmates has been rather lacking to date. Let us hope this will be remedied by a deluge of letters before the next issue of *The Review*.

At the finals of the national singles at Forest Hills in September, your Scribe, loitering below the stands between matches in the middle of the afternoon, came upon Roger Carver making a long delayed luncheon of hot dogs and beer. It seems that Roger, reimbued with the spirit of tennis as the result of his victory at the reunion, had decided at six o'clock the night before to journey to New York for the tennis finals. Fortunately, Roger was in line early enough in the morning to get a ticket to the grandstand, but he dared not leave his seat until mid-afternoon to get a bite to eat. However, Roger did not journey all the way from Shawinigan Falls, Quebec, but from Boston.

Apparently, the reunion made him homesick for the old stamping grounds, with the result that in July he left the Shawinigan Chemical Company to become assistant superintendent of the General Electric Company plant at Everett, Mass., where his wealth of experience in foundry work was in much demand.

Bill Bainbridge, XV, has left the vicinity of Boston and has become associated with the United States Gypsum Company in the roofing department in Chicago, Ill. — The newspapers have reported that Joe Keenan, XIII, Associate Professor of Mechanical Engineering at the Institute, has been elected a fellow of the American Academy of Arts and Sciences; Samuel Seegal, XV, who is assistant to the vice-president of Wm. Filene's Sons Company, is giving a course on retail buying at Boston University Evening School this winter.

We express our sincere condolences to the wife and family of Elmer Johansen, III, who was killed in the plane he was piloting near Chicago in July. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company of New York, Inc., 304 Hudson Street, New York, N.Y. C. YARDLEY CHITTICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

1923

The Alumni Fund Drive has gotten away to a good start. The preliminary announcements are just out as this is written, yet already contributions are coming in. It will greatly help if you will send in your contribution or pledge without waiting for someone to call and ask for it. A class committee is being formed for that purpose, but it would be fine if you would constitute yourself a committee of one to contact yourself about it. You are not being asked to do any more than you can, but what you can do will be appreciated.

Lem Tremaine, II, was among the few at the last reunion who could boast of still being single. He can't do it any more. I had a nice visit with him the other day, and he confessed that he was married on October 2 at Grace Church Chantry, New York City, to Miss Nell Ford Russell. He had sent me a notice of the marriage, but I hadn't seen it because I had been away for several weeks. The formal notice says that the couple will be at home after the first of November at Carleton Towers, 503 Carleton Road, Westfield, N.J. I had the good luck to see him as the couple were on their way home after a very pleasant honeymoon trip through the White Mountains. — James B. Rivers reports that he is in New Orleans. He is representative for the Southwest for Mead Johnson and Company of Evansville. He says that any of his friends who have become fathers since 1923 should know his company, as it makes infants' diet materials. He is himself a bachelor, but has the grace to apologize for it. — Roy C. Wagner, II, is another who figures in the marriage announcements. A story in the *Boston Post* tells of his marriage, September 25, at All Saints' Rectory, Greenwich, to Miss

Mildred K. Curnane of Malden. An interesting note in the ceremony was that the bride's twin sister served as matron of honor. Of further interest is the fact that both Mrs. Wagner and her sister are attorneys, and before her marriage, they had both been associated with their father in a law practice in Malden. Like most newspaper stories of weddings, the item merely said that the bridegroom was present and that he was graduated from the M.I.T.

There are a few industrial notes: Leonard J. Brooks, II, confirms the information that he was appointed factory manager of Milton Bradley Company, makers of games and school supplies at Springfield, Mass. — An item from the *Providence Journal* of October 17, made available through the courtesy of Howard F. Russell, II, reads as follows: "Robert H. Lawson, who has been connected with Hemphill Manufacturing Company, manufacturers of hosiery knitting machinery, of Central Falls, since 1923, has severed his connection with that organization, joining Lawson Products, Inc., of Pawtucket, makers of novelty knit fabrics, as development engineer, it has been announced. Mr. Lawson is prominent for his participation in the invention of knitting machinery." (And that omnibus paragraph is just as the *Journal* reporter wrote it!)

General Electric Company announces that among employees recently granted patents assigned to the company were Fred Travers, VI-A, and Harold Crotty, VI-A. Travers had produced an electric socket, and Crotty a connection block. Travers is at Bridgeport and Crotty at West Lynn. — Ed Fox, X, reports that he is now in New York City, where he has opened his own chemical laboratory. Last year he was with the Filatex Corporation of Northampton, Mass., but he left that concern about six months ago for his new private venture. Of his business he says: "Although I specialize in rubber and latex, the laboratory has become a sort of general analytical laboratory, due to the fact that a variety of work is coming in." — HORATIO L. BOND, *Secretary*, 18 Jefferson Road, South Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1924

Somewhat belated are reports recently received of marriages which have occurred in the past few months. These include the Gordon Wheelers (Regina Grace Miller) who were married in Troy, Ohio, and are now living in Wellesley; the James B. MacLeans (Muriel A. Brittin) now living in New York; and the H. Easton McMahons (Jaqueline Tompers) now living in Garden City. Following a Course at the Institute, Dr. McMahon studied at the New York University Medical College. — Two other doctors crossed the Secretary's path in recent months: Malcolm Finley, formerly a psychiatrist at the Judge Baker Guidance Center in Boston, now doing similar work in the Chicago schools, and Egon Katt-

1924 Continued

winkel, heart specialist and member of the staff of the Newton, Mass., hospital.

Bill MacCallum, for many years a licensee of Electrical Research Products in Philadelphia, has joined the staff of Modern Talking Picture Service in New York, and travels the country in the interest of better movie equipment. — From the monthly publication of the National Safety Council we learn that George C. Reinhardt, captain in United States Engineer Corps, Omaha, was an important speaker at a Kansas City meeting of the Council; judging from our recollection of Scoop as sports editor of *The Tech*, the talk likely was a good one. — The Class of 1924 plans to be a leader in subscriptions to the fund for the new gymnasium. If yours isn't in yet, don't delay. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1925

By the time these notes appear in print, I expect many of you will have responded to my appeal for news. If you haven't answered, please do so at once. — A letter from T. M. Lowe, I, states that he is now associate professor of civil engineering at the University of Florida in Gainesville and is in charge of courses in hydraulics, water supply engineering, sanitary engineering, and reinforced concrete design. Professor Lowe has been at the University since 1925, serving first as instructor and then as assistant professor. During the summers of 1929 to 1931 he carried on graduate work at the University of Wisconsin, receiving his M.S. in civil engineering from that school in 1931. Other summers have found him busy on various lines of sanitary and hydraulic engineering and construction and design work for city, state, and Federal agencies. — Another Course I man reporting is Arthur O. Odegard who has now been with the Massachusetts Public Works Department for seven years, working chiefly on estimates for highway construction. He is married and has two children.

F. W. Waterman, Jr., II, writes from Johnstown, Pa. He has been employed successively with the United States Steel Corporation in various capacities; the National Radiator Corporation, as chief engineer; Century Stove Company, as president; and John Price Jones Corporation. He is now president and treasurer of his own company, The Dustin Company, sheet metal specialists, and states that at present he keeps very busy running the gauntlet between the tax collector, the legislator, and kindred madmen. He is married and has several children.

Professor Locke '96 provides some information regarding G. B. Blonsky, III, who has left California to become mining engineer for the West States Mines, Inc., in Idaho and the sole representative of our Class in that state. His first job will be to examine mines in the vicinity of Salmon City. These mines are located well up in the hills — only about six miles from Salmon City, as the crow flies, but some 35 miles by the worst possible roads. Blonsky expects to be snowed in

more than once during the coming winter. — Herb Taylor, III, writes that he is still in the coal mining business in Illinois, and likes it. Like all other industries, he is having plenty of fun with government regulations and labor. Despite these difficulties he is convinced that the coal producing districts of Illinois are keeping right up with developments in other districts. Especially are they making extensive progress along lines of preparation and underground haulage.

I regret to announce the death on September 15 of Francis E. Baker, X. Until the time of his death, he was engaged as an entomologist at the Japanese Beetle Laboratory, Moorestown, N.J., on research work for the United States Department of Agriculture. Baker is survived by his wife, Helen M., and a daughter, Mary Louise, of Riverton, N.J., and by his father, Nathan E. Baker of Orlando, Fla.

Jim Clifford, XV, writes as follows: "I am a runagate engineer, deserting the folds of science for English literature. After a number of years at Columbia University, studying 18th Century English literature, I was lucky enough to land a traveling fellowship for a year in England. Over there, I spent my time prying into the secrets of the Johnson Circle, but did have time for many sessions with Dave Shepard of the Class of '26. With his banjo for accompaniment, we gave France and England a taste of Tech singing. — To end my story, here I am now teaching freshman composition to engineering freshmen at Lehigh University." — A note from B. A. Oxnard, IX-B, verifies the fact that he is still with the Savannah Sugar Refining Corporation, Savannah, Ga. — Address changes provide information regarding the whereabouts of several others: James R. G. Hardy, VI, has left West Redding, Conn., for South America and may be reached at Calle Corrientes 456, Buenos Aires, Argentina; Francis M. Corliss, VI, is now located at 148 East 48th Street, New York City; Benjamin Beale, X, has moved from Columbus, Ohio, and is with the Western Shade Cloth Company, Jefferson at Cermach Road, Chicago, Ill.; Edgar P. Sorensen, Aeronautical Engineering, has been promoted to the rank of Lieutenant Colonel in the Air Corps and transferred from Fort Leavenworth to Maxwell Field, Ala. — That's all for this month. Let's have some news from the rest of you. — F. LEROY FOSTER, *Secretary*, Room 6-202, M.I.T., Cambridge, Mass. HOLLIS F. WARE, *Assistant Secretary*, 17 Green Road, Medford, Mass.

1926

The Alumni Fund Campaign for the Class is fortunate in having in the field a team that looks unbeatable. In the backfield are Joe Levis, chairman of the class organization; Elton Staples, member of the general Boston committee; and George Leness, member of the general New York committee. In the line are Eben Haskell, Elmer Warren, Earl Wheeler, Guy Frisbie, Maurice Davidson,

Dave Sutter, William Hoar, Ted Mangelsdorf, John R. Kimberly, William P. Lowell, Jr., Dave Shepard, George Faithfull, and Hump Barry. Before the year is out, every member of the Class will hear from some one of these men. They have entered into the campaign enthusiastically because they are confident that members of the Class will see to it that no other Technology group does more in proportion to its resources than '26. We are going to build '26 into the new gymnasium.

Maurice L. Ash, Jr., is now treasurer of the Technology club in Detroit. — Whitney Ashbridge is back in Philadelphia after four years of active duty as head of C.C.C. camps in various parts of the South. — Elmer C. Warren is registrar, as well as director of the personnel bureau, at Colby College in Maine.

Alan Emerson Cameron, who is a member of our Class in the graduate division, has been appointed deputy minister of public works and mines in Nova Scotia. For 23 years he taught at the University of Alberta, specializing mainly in metallurgy. Writes a Canadian magazine: "Cameron knows the North Country. In 1916-17 he mapped the shores of Great Slave lake and the rivers that enter it west of Resolution, and reported on the geology of that region. In 1920 he drilled for oil at Windy Point. He has travelled the Peace River from Finlay Forks to its mouth, the country of Athabasca, and much of the Liard. He knows Great Bear lake, the Coppermine, and the canyons and 'splits' of the South Nahanni. Everywhere he has made friends. He and Mrs. Cameron have, unconsciously, endeared themselves to more mining folk than they realize. They will make many new friends in Nova Scotia."

Daniel J. Bloomberg, who represents the Class in the Hollywood studios, is now with Republic in North Hollywood. — Ronald J. Martin has moved from Somerville, Conn., to 55 Silver Street, Dover, N.H. — At a recent meeting of the New York Technology Club, the Secretary saw a number of '26 men, including Hump Barry and Al Bassett. All seemed to be aging gently as well as gracefully, and to be prosperous. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1929

If we had received a letter from some member of the Class, it could have been inserted here to make our notes more interesting. However, we have an announcement or two for you: From the columns of the *Detroiter* we learn of the appointment of Virgil McDaniel, XV, as general sales manager of the Eclipse Counterbore Company of Detroit, widely known specialists in the design and manufacture of interchangeable-end cutting tools. Mac has been in special sales work in the parts division of the Chrysler Corporation during the last two years and prior to that was with Dewey and Almy Chemical Company of Cambridge. He also operated his own chemical manufacturing company for a time. His new

1929 Continued

office will place all industrial sections of the United States and Canada under his supervision. Congratulations, Mac.

A Boston *Herald* clipping informs us of the fact that Archibald Adkins, I, and his wife have returned to the vicinity of Boston, where Adkins will be working on research in mechanical engineering at M.I.T. He has been in Denver, Colo., for four years or more, where he has been associate engineer in the United States Bureau of Reclamation. In case you do not recall it, Adkins has been married about four years to Dorothea Cheney of Belmont, Mass., so we can well surmise that the move east will be welcome to both sides of the family. Writing all that information from the brief announcement in the newspaper deserves a detailed letter from him, telling us what it is all about, don't you think?

How about a word or two from some of the rest of you? I have forgotten whether I told you that George Logan, I, when I saw him in Philadelphia, told me that Don Funk, XVII, is assistant to the head of the mechanical department of John Wanamaker's in Philadelphia, and that his duties run all the way from fixing toys up to the biggest job that happens to need attention. Probably there is more variety along engineering lines in a department store than anywhere else. Or do you hold down an engineering job that covers a broader scope? If so, tell us about it. If not, we would enjoy hearing all about it, anyway. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1930

Congratulations to John Moriarty, VII! On September 3 John took as his bride Miss Etta Luise Montgomery of Port Arthur, Texas. — Cecil Dunn, VII, who received his doctor's degree in 1934, is teaching biology this year at the Chamberlayne School in Boston. — Richard Staderman, IX-A, was a candidate for the Democratic nomination for congressman in the 17th district of New York. — Bob Crowell, XV, recently dropped in to see me, after we had discovered we were neighbors in Wollaston. Bob has been working for the American Can Company since graduation and came to the Boston office in February.

Classmates who have not yet heeded the call for support to President Compton's program of expansion of the recreational facilities at the Institute are again reminded that no greater need exists today at school. We'll all be proud of the new buildings when we see them at our 10-year reunion and doubly proud that our Class rallied to the cause in making the project possible. So send in that pledge today to Room 11-206, M.I.T.! — PARKER H. STARRATT, *General Secretary*, 75 Fenno Street, Wollaston, Mass.

COURSE X

The Rochester meeting of the American Chemical Society, in one of its minor phases, might almost have been considered as an unofficial rendezvous for '30 Course X men, for there were nine in at-

tendance. The sight of so many of the fellows together at one time was so inspiring that it prompts this current offering of news, some of which has been gathering dust for a while. Greg Smith, Stan Wells, Ralph Peters, and Dick Wilson, who are in Rochester with Eastman Kodak, all seemed to be doing well. Greg's son, David King Smith, will be two years old in December. Course X's welcome is extended to Stanley C. Wells, Jr., born June 13. Ralph Peters is kept pretty busy by two sons: Ralph, Jr., almost five years old now, and James Rowe Peters, over a year old. Although our congratulations are somewhat belated, we hope that Mr. and Mrs. Richard M. Wilson, 178 East Parkway, Rochester, N.Y., will still accept them. On November 21, 1936, Dick was married to Miss Carol Reichart of Rochester.

Attending the A.C.S. meeting from out of town were Sanford Moss, Al Vint, Whit Weinrich, Fritz Eaton, and yours truly. Sandy has earned himself a Ph.D. from Cambridge University, England, with a thesis in the study of surface phenomena. As reported earlier in *The Review*, he is now married and is engaged in research for Viscose Corporation of America at Marcus Hook, Pa. Al Vint is also interested in cellulose and is in research work with Kendall Mills, Walpole, Mass. Whit Weinrich gets around to many of the Chemical Society meetings, as a result of his development work in the Gulf Research Laboratories, Pittsburgh, Pa. Mrs. Weinrich accompanied Whit to Rochester. Fritz Eaton, who was with us as a graduate student in X-A, was back in the States again after two years at the Standard Oil of New Jersey refinery at Aruba, off the coast of Venezuela.

Once more, belated congratulations, this time to Carl and Mrs. Franz, whose Carole Mae is now almost two years old. — A paper by Schumb and Nolan, in the Analytical Edition of *Industrial and Engineering Chemistry* for August 15, presents some of the results of Ed Nolan's thesis for the M.I.T. doctorate in the Department of Chemistry. Congratulations, Ed! Tony Savina, still researching on cod liver oil with E. L. Patch Company, writes that Ed is now with Merck and Company, Rahway, N.J., in charge of a department manufacturing pharmaceutical chemicals. — Last January, I had the pleasure of seeing Chuck and Swannie Ladd, with their sons, Cushing and Richard, in their home at Ponus Ridge, New Canaan, Conn. Chuck is a patent lawyer with the New York firm of Blair, Curtis, Dunne, and Hayward. He writes that Gordon Lister, who was married about a year ago (again, congratulations!), is studying patent law at Columbia and working for the same firm. Chuck says also that Manny Birnbaum is quite happy about a new position with a big textile house in New York.

At the Absorption Symposium at Columbia, just after the Christmas of 1936, I saw Lester Steffens, who is now with Socony-Vacuum, working in the New York area. — Bob McCarron looked me

up when he had some time between trains in Bangor, last December. Bob has held a number of increasingly responsible positions in the paper industry, since graduation, and is now in the technical service department of the paper mill division of Stein, Hall, and Company, Inc., 285 Madison Avenue, New York City. — Bill Dodge and Heinie LaLone are chemical engineering for the New York *Daily News*, and I hear that there is plenty to keep a Course X man busy around a modern newspaper plant. Bill is quite the family man, three times a papa, if my source of information is correct.

This is my second year as director of the Bangor station of the Practice School. The work at Eastern and Penobscot Chemical Fiber is intensely interesting, and I am enjoying my second time in the Practice School even more than I liked the first experience in 1930. By a coincidence, Teddy, Ellen (born July 27), and I are living in an apartment that has been made of the first floor of the old Bangor student clubhouse. The address and location is one that many of you are already familiar with, which should make it easier to send in some news of yourself, or to drop in if you ever get near Bangor. — HOWARD S. GARDNER, *Secretary*, 70 Grove Street, Bangor, Maine.

1933

Well, the old place looks just about the same as it did four years ago, and surely recalled many good times when yours truly passed through Boston last October. Things are definitely on the upgrade with the Sailing Pavilion and Barbour Field House, which have been erected since I was last in Boston, and the Architectural Building which is now being constructed along Massachusetts Avenue next to the Naval Architecture Building. As usual, the time was much too short to see the people and things I should like to have seen.

During the past month I have had a letter from Cal Mohr, from Niagara Falls, asking that I call the attention of the chemical engineers and chemists to the Chemical Industries Exposition at Grand Central Palace, New York City, from December 6 to 11. Cal expects to be in town, as do a number of other boys, and suggested that we arrange a meeting here at that time. If any of you come down, I would appreciate your phoning and we will have things arranged by that time. Cal is apparently doing very nicely up in Niagara Falls with R. and H. Chemicals, where he is working with Frank Twomey. — I have also been informed that a master of science degree in biology was awarded by Brown University to C. Wallace Bohrer.

A number of marriages have been announced, some of which took place some time ago but will probably be of interest to many of you. Robert S. Burdick married Miss Elsie Kent Robottom on June 16. Burdick is now ensign on the U.S.S. *Indianapolis* attached to the Pacific Fleet and is living at Long Beach, Calif. Charles H. Thumm was married to Miss Evalyn May Gilpatrick at Evanston,

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Ill., on June 26, and E. Arthur Hungerford, Jr., to Miss Helen Gale Savery on September 4 at Hoosick, N.Y. Art is living in New York City and is still connected with the National Broadcasting Company. Canfield Hadlock wed Miss Josephine Cook on September 3. I am sure that we all are pleased to learn of these developments and wish you all the best of luck.

The writer saw Bob Holt at Montpelier, Vt., during October. Bob is still with the insurance company up there, in the research department. He says that he has recently gone in for hunting and fishing in a big way and has a good-sized tract of land near by to use for this purpose. — Emerson Norris has recently made connections with the Revere Copper and Brass Company at New Bedford in the capacity of technical adviser, and likes his new work very well. — Bob Kimball is still at the Institute, apparently working harder than ever. He is now living at Marshfield and, to hear him talk, he is the happy and proud father of three children. — Len Lindsay is with the General Electric Company at Lynn, in the time study department, and is living in Marblehead. Len Gifford is also living in Marblehead and is connected with the investment firm of Arthur Perry in Boston. — Herb Grier is still at the Institute working with Dr. Edgerton '27 on high-speed photography. Herb is married and is living in Cambridge. — Fran Vaughan is still with Du Pont.

By this time, you have probably received a number of communications from the Institute about the financial drive being made for the new athletic facilities. As these notes are being written in October, a number of donations have already been received and I hope you will all cooperate and help with this project. Our only regret is that we were probably at the Institute a number of years too soon and will have to leave the benefits of the wonderful new facilities to those who come after us. Everyone to whom I have spoken is most enthusiastic about the whole matter and has expressed his intention to help it along. — Don't forget you are saving the dates of June 4 and 5 for our five-year reunion. — GEORGE O. HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-107, M.I.T., Cambridge, Mass.

1935

The campaign is on! Have you neglected to send in your subscription? Remember, this is the Class which is going to have a subscription sent in from every member, even though the amounts be small. Don't let the matter slide another day. Remember, if you don't have the cash at the moment, you can spread your subscription over two years. In case you have mislaid the pledge card, just drop me a line and I'll send you another, pronto. Let's give the future Classes a better break than we had.

The old column will be a bit short this time, as only one letter came in during

the month. How many times have you said: "I wish some of the boys would write in. I'd like to know what they are doing"? The next time that thought occurs to you, realize that some other classmate is saying the same thing and would appreciate it if you would send in some news. Give your friends a break.

The marriages keep on apace. First on the list is that of Art Baker and Esther Sanborn. They were married early in September and Lou Baldwin was best man at the ceremony. They are living in Newark, but I am unable to tell you Art's occupation. Here's hoping Esther reads this and prods Art into writing a letter. — Next is the marriage of Dick Drury, whom you may remember from freshman year, and Louise Ferrer. They were wed recently but the details are lacking. — George Glaskaws and Eleanor Zaletsky either have or are about to walk the center aisle. They are to live in South Boston. Again I am unable to supply details of George's work. — Archie Holden and Elenor West were married September 19. Archie is with the Newport News Shipbuilding Company. — Frad Kraus and Shirley Kellner were wed recently. Fred is working for the Henry Vogt Machinery Company on heat exchangers. — Bill Richardson, who was a special student with the Class during our senior year, was married to Margaret Robertson at Rye Beach, N.H. — Last announcement of the month is that of Dick Shaw and Barbara Livermore. Their engagement was announced recently. Dick is working for the Travelers Insurance Company in Hartford.

Professor Locke '96 sent me some news about the miners. Ed Clark had a bit of misfortune while working in the Anaconda mine. Some of the lagging supports failed and caused him to fall, with bruises resulting. However, Ed is practically as good as new now. — Sandy Sanderson was transferred from Baltimore a few months ago to the plant of the American Smelting and Refining Company at Maurer, N.J. He not only inherited his predecessor's job, but he and Mrs. Sanderson inherited the latter's house also. Sandy's work has been changed, with the new job, from copper to tin. Shortly after arriving in Maurer, he got in touch with Lew Gelbert, who is with the United States Metals Refining Company in Carteret, N.J. Lew has been working on nonferrous metals lately and finds the work more interesting than iron and steel. — Carl Stratton '34 reported, while in Boston, that Stan Lane has become the happy father of Martin Bradshaw Lane. Carl and Stan are still in the assay office of the American Smelting and Refining Company at East Helena, Mont. It seems that the assay office has kept them plenty warm during the summer so they are looking forward to the time when promotions will take them outside the plant.

The lone letter of the month is from Lars Sjodahl. Here is his story: "I have changed my job twice since The Review last heard of me. At that time I was working in the laboratory of the Stand-

ard Printing Ink Company in Cincinnati. I was with them nine months and left to join the research and development department of the Champion Paper and Fibre Company in Hamilton, Ohio. My work there was with coatings almost entirely, involving a lot of experimental work on a new process. After a year and a half there, I received a fellowship in the basic science department of the Institute of Scientific Research of the University of Cincinnati. Last September I began classes at U.C. — advanced physics, math, and chemistry. The course is for two years, with half the time being spent on a co-operative job with the company sponsoring the fellowship (in my case, the Dayton Rubber Company). At the end of two years comes an M.S. in engineering." — Thanks for the letter, Lars.

There is one exceedingly sad incident to record: the accidental death of Harry Tracy. A newspaper clipping from Chicago states that he fell against a 110,000-volt x-ray tube testing circuit in the plant of the General Electric X-Ray Corporation. — While over at Harvard Engineering School, I ran across George Knapp, who is doing graduate work in communications there.

Last month I had a talk with Walt Stockmayer, Class President. Stocky returned to Tech last September and is teaching part time, while studying for a doctorate in physical chemistry. We talked mainly of the Alumni Fund Campaign and did not get around to news, so you will have to wait until the next issue for the tale of his travels. Stocky is plenty busy at school, having 20 hours of teaching plus his own studies. In addition he is managing the Fund Campaign in the Graduate House.

That's the story for this time, fellows. Don't forget two things: your subscription to the Alumni Fund and a letter to either Dick Lawrence or me. — ROBERT J. GRANBERG, *General Secretary*, McCulloch B-13, Soldiers Field, Boston, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

It seems too bad to report that the Class has not been corresponding so well as last year, but such appears to be the case. Perhaps, we hope, the condition is only temporary, but the fact still remains that I have only five letters to pass along this month. Now rather than complain any more about the scarcity of news, we'll see what the mails have to offer, and hope that some of you fellows who are still among the mysterious unknown quantities, will pretty soon let us in on the big secret about what has become of you.

Course V. A letter from Bob Sherman, written about the first of October, arrived too late for publication in the last issue, so here it is: "With the exception of three weeks, one of which I spent in Rochester, N.Y., at the American Chemical Society convention, I have been working here at the Institute assisting in analytical chemistry all summer. It kept

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me busy but not too busy, so I had a chance to take up sailing. . . . Brent Lowe is still with Scovill and still in the training course — will he never finish? At present he is in the planning department, which he likes very much. . . . Bill Saylor is a full-fledged engineer with G.E. down in Philly, and is at present living in Upper Darby. It seems he went down there expecting to take a training course, but because the company was rushed for men, they excused him from that and put him in the circuit breaker department. As a result, Bill, not knowing much about that field, spent a month in Schenectady, learning. Now he is working on electrifying the Pennsy Railroad. Marion Mader arrived back from Europe, September 16, in Baltimore. Bill met her, and she spent a week with him there. At present she is in Cambridge preparing for their wedding, which is scheduled for the Friday after Thanksgiving. (Congratulations to Bill and Marion are in order, and we tender them, along with many best wishes.) Bill claims he met George Payne some time in August and found that he is living in Chester, Pa., working for the Sun Oil Company. It seems he has invested in a Ford 1935 coupé and otherwise is the same old fellow. George was up here late last spring and explained that he was doing work connected with laying out a new plant. On August 10 I ran into Hawthorne Brown. He was up here (Brain-tree) to spend a vacation with his folks. He had been with Western Electric for five months as a planning engineer in Baltimore. The company he went with first in New York sold out.

"Now for my own Course: Fred Carten had a job as a research chemist with the Atlantic Research Associates here in Boston, and claims he spent a very profitable summer. . . . Anslow and Donaldson were both up this summer for short stays, but I hadn't the chance to talk with them. Both are at the same old jobs, as far as I know. If Willie will take it into his head to write to me, it may be that I will be able to get in more news about the gang down in New York. Bud Milone was here all summer working as an organic qualitative analyst. At present he is rooming up the river with four other fellows. . . . Art Sedoff has apparently left the University of Idaho, and is known to have been corresponding with some paper firms out in Washington or Oregon. Whether or not he has a job there, or, in fact, where he is, is an unknown quantity. Mike Sieminski is still assisting Professor Schwarz'23 in the textile lab. My present roommate, Bill Yelland, who is working in that part of the building, claims that Mike keeps pretty busy. I guess Mike has given up his ideas of an advanced degree, and plans to devote himself to work. Barney Vonnegut plans to come back again this year to continue his study. . . .

"Charlie Saffer achieved his master's degree in June, spent most of the summer around here, and plans to take his Ph.D. exams this coming October. Charlie sure deserves credit for the application he has

been showing. . . . Louis Stahl used to drop in on me occasionally but has not lately. He is up to the same old job and the same old tricks according to Freddie Carten. Bob Price, who was married some time ago, is teaching in the University of Vermont this year, substituting for Professor Baum, who is spending a sabbatical year at Tech. Brothers Heggie and Clapp, a pair well known to the members of our Class, are still here as research associates and are going to teach organic chemistry for, I understand, the first time here at Tech. A couple of days ago, who should drop in but Harry Herpers. He has given up his job to come back here and study for an advanced degree in geology. A year of industry has left him unscathed. . . . Joe Ackerman worked for Givandan Delawanna, Inc., in Passaic, N.J., all summer, doing chemical research and small-scale production work. He is back here now." — Not content with all the news he had to offer, Bob followed his letter with another, inclosing a letter he had received from Walt Squires. The news about Walt is included under Course X.

Course VII. Ed Pratt writes from his Harvard Medical School residence to assure us that he managed to gather some of the news he promised last month: "The second year here promises to be a busy one but even more interesting than the last. I have a nice suite of three rooms and two roommates. So far I haven't been over to the Institute, but I expect to go soon and perhaps there will be some news there for your column. . . . Justin Shapiro writes that he passed his state license and civil service exams for sanitary inspector, but no position was forthcoming. Hence, he started in business for himself, and is now in the executive division of the Polytherm Corporation, 707 Broadway, Paterson, N.J. He says that business is erratic, but he hopes to come out all right. Bill Steinhurst writes that he has a position in the state department of public health here in Boston. Kay Shott is a bacteriologist in some sugar refinery. Stan Freedman is supposed to be studying for a master's degree at Amherst. I am inclosing a letter from Louis Proulx."

And here are some excerpts from Louis' letter: "I worked for the Massachusetts State Department of Public Health for two months after graduation, during which time I lived at home. That job consisted of experimental sewage treatment at Nut Island near Quincy. Towards the last of October, I got wind of this job . . . and I was appointed to start work November 2 [1936]. Accordingly, the Mrs. and I came here to West Hartford, and took up our abode (135 Richard Street, West Hartford, Conn.). I am sanitary inspector in the West Hartford Department of Public Health. . . . My work consists of inspecting dairies, food stores, restaurants, and so on, collecting milk samples, investigating complaints, and supervising septic tank installations. . . . You might be interested to know that 40-quart milk cans haven't passed entirely out of the picture, at least not in these parts. . . . Bill Healy is educa-

tional adviser for the 129th C.C.C. camp at Windsor, Vt. Ed Knight is with the state health department at Phoenix, Ariz. Stan Stolz went to the Westchester County Health Unit after graduation, from whence he went out to Detroit to work for an industrial hygiene agency. Recently, he has gone to work for the New York State Department."

Course X. Proving that he is making a noble effort to secure a small measure of news about this gang, El Koontz has sent me a copy of one of his inimitable questionnaires. Tucked in among such questions as "Are you a member of the C.I.O. (Shame on you)" and "Are you an engineer still-yet? (If so, please include sample of hair from ear as proof)" are a few inquiries which should lead to some interesting news. Meanwhile, he presents a bit of local gossip: "Nate Ayer spent most of his vacation with me, and part of the festivities included a trip to Bermuda for a week. Had a wonderful time. Typical picture: Ayer and Koontz lolling on the sundeck of the S.S. *Monarch of Bermuda* in bathing trunks, a Scotch and soda in one hand, playing the horse races. What a life! Nate and I also spent one evening with Mr. and Mrs. E. H. Cargen in their suite at Knickerbocker Village, New York City. The young Mrs. Cargen is a noble cook, and Hank mixes a noble Martini. Perfect picture of wedded bliss. Mr. and Mrs. J. C. Austin were unable to join us for the evening on account of being on Long Island painting the now famous Austin sailboat. Gordon C. Thomas has blossomed out almost simultaneously with a new car and a new blonde. Otherwise is still busy making paper at Milford, N.J. . . . At present, I'm still laboring in Philly although . . . I'm now ensconced in a shiny new apartment (2040 Locust Street, Philadelphia)." — And thus endeth the Koontz epistle.

A letter from 3036 Washington Avenue, Baton Rouge, La., tells how Walt Squires and his Betty are managing very nicely, thank you. Betty is joining the student ranks of Louisiana State University by enrolling as a special student for one course. "It helps to use up her spare time and gives her a chance to use the L.S.U. swimming pool." Walt relates that Herb Borden is getting along fine at Tidewater down at Bayonne, N.J., and Bob Worden has moved back to Pennsylvania and is now located at 222 Campbell Avenue, Upper Darby. Incidentally, I suppose I ought to mention that Walt is working for the Standard Oil Development Co.

Course XIII. From Art Wells, we have received the following: "News from Newport News, where Sherburne, Donnon, Graham, and Rowe are putting their all into ship designing and building, has it that a good summer was had by all. Ed Rowe says that he and Sherb did a bit of sailing in the Hampton one-design class. In a matter-of-fact way he hints that they won about every race they entered, including the Atlantic Coast championship, run by the Hampton Yacht Club. Sherb has recently been transferred to the hull technical department at Newport

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News and will have a thing or two to say about the design of watertight bulkheads for the U. S. Lines' so-called replacement of the S.S. *Leviathan*. Sherburne and Rowe are living at 115 Harbor Drive, Indian River Park, Hampton, Va. Although I have not heard directly from Al Horton, Rowe says that this summer Horton was in charge of acceptance trials on a hydraulic dredge out in the wilds of Missouri. Bob Wead is still a Bostonian. He recently joined B. F. Sturtevant Company, and is now designing ventilation equipment at their Hyde Park division, spending his spare hours studying ventilation engineering. Bob is living at 474 Brookline Avenue, Boston. A recent report gives Ed Brewster's address as 1001 St. Paul Street, Baltimore, Md. The S.S. *Manhattan* sailed on October 6 with Harrison Woodman aboard in the pursuer's department. Woodie will make a few crossings with the U. S. Lines before joining the operating department ashore. Bob Woodcock is now an insurance broker and has an office at 123 William Street, New York City."

Course XIV. From his Niagara Falls residence at 5815 Buffalo Avenue, Jack Hamilton writes a bit of news for us: "The only member of Course XIV from whom I've heard since last spring is Dick Hitchcock, who is still with Revere at Rome, N.Y. He seems to be well entrenched, having had several substantial raises, and has been driving a 1937 Dodge since last July. His work is now concentrated on corrosion research, the physical testing end having been taken over by J. A. Clark '18 who has recently joined the staff of Revere's lab. At the Alumni Association picnic on September 18, it was rumored that Dick Robinson had committed matrimony, but I haven't yet been able to verify this, having seen neither hide nor hair of Robbie since early in the spring. The doings of Brown, Wade, and Kanner remain shrouded in mystery. Mention of matrimony reminds me that I ran into Bill Hope in the middle of September and discovered that his leanings in that direction have become much more definite. In the meantime, he seemed satisfied with his job with Moore Research and an occasional trip home."

"My own story can be made quite short. Most of the summer has been spent in designing and drawing plans for two new sets of larger scale apparatus to be used in our high-pressure studies. While these are abuilding, my work remains very

much as before, varying our technique in devious ways in order to observe the effects on the reaction and in the hope of increasing our present low yields. Ariel Thomas and I drove up around the Gaspé Peninsula and back along the St. Lawrence early in July with short stops at Camp Technology in Maine, at Passamaquoddy, Percé, Quebec, and Montreal. The only drawback was the lack of time for full appreciation."

To wind up our column, we have a few miscellaneous items. First, we find that Charlie Price has left the job he had with the Bethlehem Steel Company at Bethlehem, Pa., and is now located in Montana, working in the mines of the Anaconda Copper Company. — The only wedding we have to report is that of Stanley W. Brown to Miss Margaret Hanemann of Garden City on August 28. The newlyweds are living on North Fifth Street, New Hyde Park, N.Y. Finally, I might give a brief account of myself. Having completed my training at the Linde plant in Trafford, Pa., I'm now busy traveling for awhile and helping with surveys of the various liquid oxygen plants to increase production and economy of operation. The writing of these notes finds me in Youngstown, Ohio, with prospects of two weeks each in Chicago, Indianapolis, Cleveland, Columbus, and perhaps a few more spots before I return to the lab in Buffalo. Meanwhile, my address for mail is given below. — ANTON E. HITTL, *General Secretary*, 23 Sewall Street, Melrose, Mass. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

1937

All we know is what you fellows read in the papers and send in to us — or just what you send in to us, whether you have read it, heard it, or "just knew it." So far, we have had news letters from two, Vic Kron and Dave McClellan. Vic seems to have hit the nail on the head in his well-written letter from Endicott, N.Y. (31 Adams Avenue): "If the Class of '37 is like its predecessors, you, as secretary, will be hard put in writing the usual class notes for *The Review*." With this as an opening wedge he launches into four pages of very fine news of this and that, in which he "points with pride" at the progress he can make with his training and "views with alarm" the sad state of his affairs with the OAO (sigh). Cleverly he rings that in, while talking of

Dick Karch, saying that "Jim Farley acts as Cupid for both of us." Bob deRaimes is with Vic at International Business Machine. Hugh Smith was also to have been there had he not changed some plans. — Dave is at Ryerson Steel, gradually forcing out the "higher-ups." He seemed to be very well satisfied except for the condition of the stock market at that time and for the sizes of steel orders. We might say, "Remember Wrigley and Woolworth," but we're not sure it would be wise.

Again this year the General Electric Company took several of the boys under its protective wing: Joseph F. Wiggins and Gordon B. Wilkes, Jr., are student engineers at the Lynn plant. Arthur V. Hughes, Curtis Hillyer, and Teh-ching Li are at Schenectady. Nathaniel M. Osborne, Jr., is at Pittsfield, Mass., and the boys of Course II-A who were spending some time in various parts of the country are back at the Institute finishing the fifth year.

Ed Hobson is here in Bound Brook with the Bakelite Company and is as eager as ever for a rousing good time. — George Wemple is, we understand (not owning a large enough block of stock to go browsing in the vaults we wouldn't be sure), with the National City Bank in New York.

Just as we were going to press, a bit of very fine news was thrust under our nose; it "listens very well": J. W. Montgomery, III, is engineer for the Red Lake Gold Shore Mines, Ltd., at Red Lake, Ontario, and his address is Red Lake Hotel, Red Lake, Ontario. After graduation he made a quick trip through Canada, visiting some of the mining districts of Quebec and Ontario and then went to his home in Alberta for a short visit before taking the job at Red Lake. The Gold Shore Mine is producing at the rate of 150 tons of ore per day and the cyanide plant recovers the gold. The man who was formerly engineer left the job, which means that Montgomery and the surveyor have the entire engineering work to do, which gave them a rather difficult time but was affording most valuable experience.

Many of us will remember with a wisp of a tear the smiling personality of William W. Tripp and his stories of the *Morro Castle* tragedy — the tear because tragedy overtook him in an unsuccessful operation on August 26, 1936. — WINTHROP A. JOHNS, *General Secretary*, 114 Beechwood Avenue, Bound Brook, N.J.

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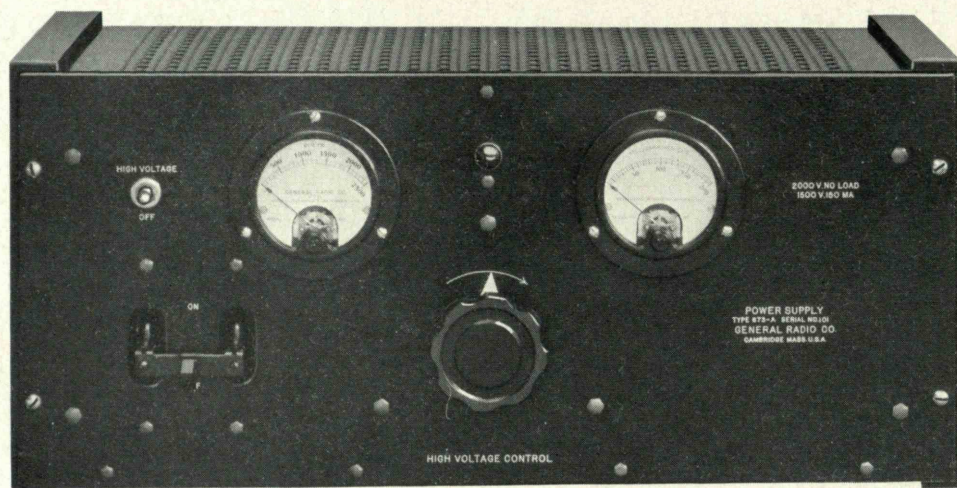
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